

# The effect of innovative activity on performance in nascent Finnish mutual fund market in 1997-2010

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## Abstract

Purpose of the study

Dynamics of competition among companies has many reasons, and these dynamics eventually have their effect on company performance. Innovating has been alleged to be one factor affecting companies' competitive positions. In this thesis, the effect of innovative activity, which was derived from new product introductions, on market based performance, which is company's market share change, was investigated. Moreover, the study was performed on a nascent and rapidly growing market, a setting that historically has received close to zero attention in the research on the relationship between innovative activity, specifically when it comes to new product introductions, and performance.

Methodology

The study was performed on the Finnish mutual fund market during the years of 1997-2010. The one objective was to examine the evolution of the mutual fund market and the other was to inspect the relationship between innovative activity and market based performance. The former was carried out descriptively using simple average figures, and the latter by employing statistical methods, namely fixed-effects panel data analysis using linear regression.

Findings

The results show that the growth of the mutual fund market has been rapid and it eventually matches a similar level of importance among financial instruments as in other European countries. Also, the market has become perhaps even more clearly dominated by few big management companies owned by commercial banks. These companies introduce most of the new funds but the number of these introductions contrasted with existing resources, which represents innovative activity, is lower than among smaller companies. It was found that both new product introductions alone and innovative activity even to larger extent positively affect market share change. In addition, the results implicate that new product introductions may play a different kind of role for different sized companies, i.e. bigger companies benefit it when they defend their market positions, and thus performance, and smaller companies utilize new product introductions as a means to grow by market share, and thus increase performance. These findings were expected in the light of former theories, namely first-mover advantage and the Red Queen effect. Thus, basing on these results, the positive relationship between innovative activity and performance seems to exist also in a nascent market setting.

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**Keywords** New product introductions, innovative activity, market share, the Red Queen effect, first-mover advantage

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# 1 Introduction

## 1.1 Background

Every company has to make decisions in relation to how to compete in the market full of rivalry. Competition drives companies to modify their activities, and by doing so they respond to visible actions of rivals in order to achieve the determined outcomes of their businesses. Innovation and discovery have been argued to be in the key role in competition (Acs and Audretsch, 1987; Jacobson, 1992), and the performance differences stemming from heterogeneity in these competitive activities among competing companies is a fundamental issue in strategic management<sup>1</sup> and strategic marketing (Hunt and Morgan, 1995). Basing on this, the usefulness of fostering the knowledge of how innovations as competitive actions alter the relevant outcomes is apparent.

There is extensive research concentrating on the positive performance effects of competitive actions (cf. Derfus et al., 2008; Ferrier et al., 1999, and Young et al., 1996) and innovative activity (cf. and Acs and Audretsch, 1987; Roberts and Amit, 2003). However, the research is invariably done in mature markets and the evolving markets have received next to zero attention. Especially the relationship of new product introductions and performance on nascent and rapidly growing markets can be regarded as unstudied territory<sup>2</sup>.

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<sup>1</sup> In fact the issue has been quintessential since the early days of Schumpeter's insights on "creative destruction" (in Derfus et al., 2008).

<sup>2</sup> See Smith et al. "Competitive Dynamics Research: Critique and Future Directions", in the Blackwell

Because the growth of the market brings about changes in individual companies and because these companies still need to find ways to manage their businesses in the competitive environment in disequilibrium, the call for filling the abovementioned research gap exists.

## 1.2 Research problems and objective

The objective is to inspect the relationship between innovative activity (counted on the basis of new product introductions) and market based performance in a nascent market. This is also how this study contributes to the existing knowledge on innovations' performance effects from the strategic management and marketing perspective. Based on the background motivation and literature two research questions were formulated:

1. How has the mutual fund market evolved from 1997 to 2010 in Finland, specifically with respect to introducing new products?
2. How does innovative activity affect the market performance of management companies in the changing competitive environment of Finnish mutual fund market?

## 1.3 Methodology and scope

The empirical part of the study is based on the management companies operating on the mutual fund market in Finland during 1997-2010. The used data was compiled from mutual fund reports which are already constructed by an independent organization called the Finnish Association of Mutual Funds (which in September 2009 turned being a part of Federation of Finnish Financial Services). Twenty companies were selected by size and their aggregate size covered over 95% of the studied market and competitive environment.

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Handbook of Strategic Management, edited by Hitt, Freeman, and Harrison (2001). They do elaborate on the effect of competitive environment, for example market growth rate, but the age of the industry, that is how nascent it is, is overridden.

As the main objective is to inspect innovative activity and its effect in market based performance during the evolution of the mutual fund market, the selected analysis method is longitudinal panel data regression. Due to restrictions in the available data, fixed effects method was applied. The inspection of the evolution of the mutual fund market is addressed by simpler methods, such as descriptive statistics, basing on the same data but also rendering some appropriate complementary information in order to form a better view.

The study has a strategic management/marketing perspective with a theoretical domain of Schumpeterian competition. The basic idea behind the study is to illuminate how companies' strategic choices with respect to new product introductions affect their market performance. Due to the selected perspective, for example detailed product characteristics are out of the scope of this study. Nevertheless, they are taken into account as company level characteristics by incorporating them as average figures. In addition to company level of analysis, the market level is used in responding to the first research question of mutual fund market evolution.

## 1.4 Key concepts

The key concepts are briefly explained in order to clarify the used terms. Further explanations and definitions are developed especially in the literature review and in the research methods.

Innovation is a humongous concept. Even so, it is important to understand the quite simple dependence of innovation, *new product introductions* and *innovative activity*, which are described shortly in the literature review and to some extent in the research methods. New product introductions, which represent sheer competitive acts, are a sub-category of innovation, and these introductions can be radical or incremental. This thesis verges the emphasis on the incremental side. Innovative activity, in turn, is launched innovations contrasted with the then existed resources which were utilized to innovate (e.g. Acs and Audretsch, 1987 and Roberts and Amit, 2003), and it represents company's propensity to launch new products or take on these incremental competitive acts. In this thesis, innovative activity is new product introductions divided by company size.

Ferrier et al. (1999, p. 373) state that “[f]or Austrian economists, the central unit of analysis in describing the character of the market process is purposeful action”. Further, they define *competitive actions* as “any newly developed market-based move that challenges the status quo of the market process” (ibid.). Here, market process refers to the Austrian view of competition being a process of discovery in constantly changing market place (Jacobson, 1992, p. 785), which, as a matter of fact, describes the term *competitive dynamics*. Thus, in this thesis new product introductions represent competitive actions and heterogeneity among companies in introducing new products represents competitive dynamics.

*Mutual fund market* is the market where transactions with respect to mutual fund commerce are performed. In this market, asset management companies offer their selection of different mutual funds to the public, and this market is the place where these companies compete. Khorana et al. (2005) use the term “mutual fund industry” to portray this same place for carrying out these transactions. Although the difference between “market” and “industry” may seem semantic, there is a slight difference (not least because “industry” has a meaning that relates to manufacturing something). In this thesis “market” term is preferred in general, but also “industry” term is used in some places since it emphasizes the role of asset management companies as a whole and especially their administrative procedures, back-office operations etc., which in turn are reflected in their actions in this specific marketplace.

*Management company* is a catch-all phrase for fund companies without any further definitions or specifications. Later on the word “company” is used to indicate this, and this is also the entity of analyzing competitive actions and the effect of these actions. In Finland, management companies are supervised by Financial Supervisory Authority governed by legislation<sup>3</sup>. Companies managing mutual funds can be seen operating as any other companies in any other industries, and their selection of funds in this thesis is called *product portfolio*. Further, the use of “product” instead of “service” was chosen basically due to the established use of the term “new product introductions”, even though mutual funds are one sub-category of financial services (Barras, 1990) and they comply with the definition of service since customer buying a mutual fund share in essence buys performance (i.e. profits for the

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<sup>3</sup> Specifically, Act on Common Funds, which up-to-date version is 48/1999.



investment) which is intangible, cannot be stored, is perishable, and come into existence at the same time when mutual funds are bought.

## 1.5 Outline

The outline of the thesis from the second chapter onwards is as follows:

The second chapter of the literature review covers the theoretical foundations from the selected perspective. Thus, innovations, competitive dynamics and new product introductions are discussed briefly with an objective to give a view on the theoretical foundations of the research area, motivate on the subject and rationalize why new product introductions matter. Further, the last section of the chapter concentrates more accurately on developing the link between new product introductions and market performance basing on the discussed theory.

The third chapter illustrates the research data and methods. In this chapter the data collection and the research context are explained in detail, and the selected method of analysis and its justifications are given.

The fourth chapter presents the results for the analysis of the data in order to answer the research questions. The first part focuses on the market evolution which is the first research question, and also portrays the study context for the second research question which is the main objective of this thesis. The second part shows the panel data analysis results with the discussion on the basis of the theoretical foundation.

The fifth chapter draws conclusions on the research findings and gives implications for managers. Also, the limitations of the study are discussed here and some directions for future research are expressed.

## 2 Literature review

In this section the theoretical foundation of the study is discussed from the Schumpeterian premise. First, though the covering of the entire extremely broad literature of innovation is out of the scope of this thesis, some general points on innovations and innovativeness and views on their research are elucidated. Second, the significance of innovating in competitive dynamics is expounded keeping particular focus on the performance effects in mind. Here, theories of first-mover advantage and the Red Queen effect are discussed. Third, new product introductions, which are in this thesis considered as incremental innovations and are the basis for calculating innovative activity, are connected with firm performance basing on the two competitive theories. Moreover, in this thesis the nascent market characteristic is one additional prerequisite and it also steers the discussion of the topics to some degree.

### 2.1 Prior research on innovations

The interest in innovations originates from the alleged positive performance implications. For example, the research done by Walker (2004) and Geroski et al. (1993) evidently shows a link between innovations and higher company performance. Also, even though the view is from the industrial organization premises, Audretsch and Mahmood (1994) find innovative activity to improve company's post-entry growth measured by the number of employees, and this is consistent in the growing markets as well. Moreover, the positive performance link of greater innovative activity is suggested to be persistent (Roberts, 2001). According to Bowen et al. (2010), however, prior research has not acknowledged sufficiently the lagged nature of the relationship between innovation and performance, and when this is built into the causal models, as they did, the positive relationship "may be observed"<sup>4</sup>. Damanpour and Evan (1984) have similar arguments on the lagged nature of innovation's effect on performance.

Geroski et al. (1993) illuminate two possible ways how innovations may be associated with superior performance. The first and more common view sees it as a product of innovative process because new innovations improve firm's competitive position in relation to its rivals,

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<sup>4</sup> As a remark, their stance on the issue on innovation-performance linkage is very doubtful.

and the second view sees it as a process of innovation because it transforms firm's internal capabilities and thus makes it more flexible and adaptable to different market conditions in relation to its rivals. Supposedly, both of these factors have their impact on performance, and this was also noted by Geroski (ibid.). It should be noted that the second view resembles particular firm specific propensity to innovate or its innovativeness, which also Walker (2004) discusses. Further, another possible route for innovations to lead to better performance is a mediating role in the direct causal relationship between market orientation and organizational performance, as was argued by Han et al. (1998).

The differing typologies of innovation set fairly large ambiguity in the concept. One realistic way to approach what is innovation is to examine it as newness from different angles by viewing the related components: what is new (product, service, process or even skill), how new it is (the level of newness; radical or incremental), and to whom it is new (to company or to market) (Johannessen et al., 2001). This newness is, according to Johannessen et al. (ibid.), the common denominator of innovation at organizational level, and they see no need to fragment the structure of innovation into categories or types. Furthermore, they state, the radicalness of newness which is a gradual measure can be used to distinguish innovations and to measure them. This, in conjunction with the actual number of new commercialized product or services, could represent a more holistic view on firm's innovative activity.

Another view was suggested by Harmancioglu et al. (2009). They propose that theoretical foundation (whether adoption/diffusion or resource-based/contingency view), level of analysis (whether product/project or company/SBU/program) and perspective (whether customer or firm) represent the most common bases for classification of innovation in marketing, management and engineering literature. Especially, what is relevant for conducting research, the question "what constitutes as an innovation?" is expounded. The radicalness of newness of new product was produced by both Johannessen et al. (2001) and Harmancioglu et al. (2009) which is inevitably important for classifying innovations.

Also, distribution of innovations to different types has been suggested (Damanpour, 1991). This kind of division of innovations into product/service, technology and administrative classes might be of salience for assessing their differences both in the input side of innovations and the outcome side of innovating,. Likewise, finding their dynamic relationship

in product/service development which concerns the case of introducing product and manufacturing process innovations may play a significant role here, and so may the chronological order of introducing administrative and technological innovations within a company, as was discussed by Damanpour and Gopalakrishnan (2001). These types of classifications have been successfully used in some empirical studies focusing on the innovation-performance relationship (see e.g. the research done by Roberts and Amit (2003) and Damanpour et al. (2009)).

In the midst of the evolution of more and more competitive business environments, the role of understanding and managing innovation has also become paramount. Smith et al. (2008) propose nine factors (management style and leadership, resources, organizational structure, technology, knowledge management, corporate strategy, employees and the innovation process, of which knowledge management and employees are the most important ones) that play an antecedent role in managing the organizational innovation, and these factors are interrelated. Based on their study, Smith et al. (ibid.) find that the key factor in managing the innovation is organizational culture which “emerges and develops through changes in other factors”. This means in practical sense that managers should examine the status of the suggested factors in their own organization and see how they can leverage the interrelated nature of the factors to achieve their innovation management goals.

The research on innovations witnesses several choices, as was already implicitly illustrated in the case of innovation typologies. This introduces ambiguity (Damanpour, 1991) which further contributes to challenges in research on innovations. The first choice asks for taking some view on the theoretical perspectives which are various (ibid.). This rather lengthy subject is not discussed here. The second choice relates to how innovation is operationalized, whereas the third one addresses the selection of the criterion variable.

Operationalization of innovation or innovative activity in the research setting gives answer to the already-mentioned question of what constitutes as an innovation or innovative activity. It is extremely common to look at innovation from only R&D perspective and as an outcome of these activities, and yet it possesses multi-dimensional characteristics (Manu and Sriram, 1996). This is especially the case when assessing break-through innovations. Other commonly used variables in addition to R&D inputs to account for innovative activities are patent

counts, patent citations and counts of new product introductions (Hagedoorn and Cloodt, 2003). The problems suggested with some of these measures are that they somehow ignore the total magnitude of innovative activities. R&D inputs do not take the desired outcome of developing new products, i.e. commercialized products, into account. Not every innovation is patented, or the other way around, not all patented innovations lead to commercialized products, as was the case with R&D inputs. New products might be what is the most salient for the research with respect to performance link, but if the research focuses on some other aspects of innovativeness (e.g. the abovementioned cultural dimension of innovativeness in organization), then this also may lack some validity. Moreover, as Geroski et al. (1993) note, successfully commercialized innovations, such as new products, may present a sample selection bias since unsuccessful innovations are left out from research. The prospect of these different measures overlapping only vaguely and possible differing preferences in utilizing them in different research settings was proposed by Hagedoorn and Cloodt (2003) in their article on measuring innovative activity<sup>5</sup>, suggesting large discretion of the researcher. All in all, these abovementioned innovation<sup>-</sup>measures can be distinguished as inputs in the innovation process (e.g. R&D inputs) and outputs from the same process (e.g. patent and new product introductions counts).

The third choice, criterion variable, involves measuring the impacts of innovation or innovative activity and it most typically means some performance outcome, particularly when strategic management discipline is in question. For example, Sorescu and Spanjol (2008) investigated three different facets of company performance (namely, normal profits, economic rents and total firm risk) and found that incremental and break-through innovations had differing impacts on these performance measures. Additionally, performance can be quantified on different levels of analysis, most commonly company level, as in strategic management and also in this thesis, or brand-level, as often in marketing (e.g. Slotegraaf and Pauwels, 2008).

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<sup>5</sup> In the article a term “innovative performance” is used to represent the magnitude of these activities.

## 2.2 Competitive dynamics and innovative activity

Competitive actions, such as developing new products and ultimately introducing innovative products, can be of great salience when companies strive to achieve (and in many cases preferably long-term) competitive advantages and so improve their performance. As these actions rarely exist without some level of response from competitors' part, the competition remains dynamic. There are many theories dealing with competitive dynamics with respect to strategic management (cf. Ketchen et al., 2004). The interest in this thesis is on competitive advantage caused by competitive actions, more accurately first-mover advantages (Lieberman and Montgomery, 1988), and another related phenomenon known as the Red Queen effect (Derfus et al., 2008). Moreover, the deeper grounds of these two theories lie on the Austrian School of strategy and particularly Schumpeter, who is often linked to this doctrine of competition and innovation. Schumpeter systematically connects survival and higher performance of a company in a competitive situation in an instable marketplace with discovery and innovation (Jacobson, 1992).

Where innovations are intertwined with evolutionary processes of industries and markets and are widely regarded as a source for industry evolution (Reinganum, 1985) or at least shaping it (Audretsch 1995a), the competitive actions have received less attention. Innovations can in the Schumpeterian sense bring about "creative destruction" or shape industry in a smaller scale through changes in market structure, for example by lowering industry concentration (Geroski and Pomroy, 1990), and possibly via increased competition. Rindova et al. (2010) illuminate the competition early in the evolution of an industry and suggest that there are indeed differences in competitive actions in the nascent market compared to a mature one. They find, for example, that simplicity of competitive actions positively affects company performance (here increase in market value of company was used) in high-ambiguity condition, whereas in established industries the relationship is negative. This difference, they state, may be due to competitors' understanding of competitive implications of actions. In nascent industry the meaning and implications of actions need to be realized before they can be counter-acted upon. Also Chen et al. (2010) conclude in a similar manner on the grounds of an experiential Markstrat simulation, and they incorporate the past performance of a company into the equation as well. They suggest that high-performing companies, measured by market share, focus on maintaining their position, and the strategies for succeeding in this

vary depending on the impermanence of competitive advantages. These companies take little competitive actions in established markets and much more in new less stable markets. Low-performing companies, on the other hand, try to disrupt the leading companies' market positions in established markets by taking competitive actions, but doubt doing so in new markets due to lack of understanding of how to produce these disruptions.

### 2.2.1 First-mover advantages

In relation to rivalry and competitive positions, first-movers in the marketplace are likely to experience advantages (Lieberman and Montgomery, 1988), such as greater market share in new markets (Robinson et al., 1994). Although market share as a dependent performance variable has been found to be biased with respect to the significance of first-mover advantage (Lieberman and Montgomery, 1988; Van der Werf and Mahon, 1997), these advantages are also in some cases found to result in other kinds of superior financial performance (Damanapour and Gopalakrishnan, 2001; Sorescu et al., 2003). According to Lieberman and Montgomery (1988) advantages are accrued through an endogenous process in which the company has no decisive power. This endogenous process arises from three primary sources, namely technological leadership, preemption of assets and buyer switching costs. One further precondition is that a company coincidentally has to have some kind of initial asymmetry with respect to its competitors, and this means that it is somehow a first-mover in a certain market segment. In addition, the theory illustrates specifically the role of innovation when Lieberman and Montgomery (ibid.) posit that one of the crucial mechanisms to achieve these advantages is success in R&D (which is a part of technological leadership aspect as one source of advantage). This statement closely relates to Schumpeterian perspective on innovation bringing about competitive advantages.

The definition of advantage in this situation is, not surprisingly, fairly straightforward, but the concept of first-mover is a little more complicated (Robinson et al., 1994). However, a company selling a new product first in the market (in this situation the company is called market pioneer) is considered as the standard definition of it (Lieberman and Montgomery, 1998). Still, in their earlier research Lieberman and Montgomery (1988) fairly ponder the relevancy of a company, which enters an established market but utilizes only a new technology or offers products to a new demand segment, to be classified as a first-mover and

consequently possibly gain advantages based on being a first-mover. Despite of this ambivalence, for example Makadok (1998) employs first products in product categories with different characteristics and these play as new products to different demand segments in his study where sustainable first-mover advantages in low-barrier mutual fund market were found to exist. The companies introducing these firsts are regarded as first-movers in the same vein as Lieberman and Montgomery (1988) did in their detailed account on this theory. Further, Min et al. (2006) categorized first-movers based on the level of the product innovation, i.e. really new versus incremental, in their study on differences of first-mover survival relative to these two innovation type markets. On the ground of these examples, the theory seems to apply to different situations and different types of new introductions, and therefore what constitutes as a first-mover (or rather, how the first-mover company is perceived) can be defined quite broadly.

Though there is evidence of first mover's performance advantages, the positive linkage between being first in doing something in the market and sustaining performance advantages is not so clear (Kerin et al., 1992). This is the case especially when market is evolving (Suarez and Lanzolla, 2005). It is important to realize that the relationship may derive from subsequently developed resources and capabilities, not just a mere occurrence of being a pioneer in that market (Lieberman and Montgomery, 1998), because pioneering only creates opportunities to achieve desired outcomes (Kerin et al., 1992). Then, these on-the-side developed latent outcomes may play a greater role in sustaining performance advantages compared to just the simple impact of, for example, introducing industry or market firsts. Roberts and Amit (2003, p. 113) suggest that it is "the propensity to move first into new initiatives [which] may enhance a firm's overall competitive position". All in all, basing on this it is logical to assume that being active in developing and introducing new products to market (the discussion on new product introductions is in chapter 2.3) enhances the probability to experience performance advantages also in the long run. Despite the obvious importance of sustainable advantages in competitive situations, the interest of this thesis lies in shorter time-scale performance effects, and at least the statistical analysis is performed only by taking shorter time-scale effects into account. The discussion of the Red Queen effect which can be easily related to competitive situations also in a shorter time-scale follows.



### 2.2.2 The Red Queen effect

One of the first applications of this fairy tale<sup>6</sup> based concept was in the field of molecular evolution by Van Valen (1973), and afterwards the theory has been utilized also in business context, most notably by Barnett with his research associates (Barnett and Burgelman, 1996; Barnett and Pontikes, 2008) and Derfus et al. (2008).

According to the Red Queen effect, competition and competitive actions are inevitable in order to a company even to maintain its position relative to its competitors. Where one firm acts, its competitors can already be counteracting, that is taking their own competitive actions such as innovating and introducing new products or services, which causes even more increased rivalry in the marketplace. The competition poses pressures and companies have to adapt to the situation or die. With this in mind it is evident that firms are impelled to “search, undertake new actions, and learn in an effort to improve performance” (Derfus et al., 2008, p. 62) or, as said, even to survive competition. In a multi-industry study Derfus et al. (ibid.) found that company’s increased number of competitive actions also increases its performance<sup>7</sup>. Inversely, the competitive actions by competitors turned out to be harmful to the focal company performance. Therefore, competitive actions by a focal company and its competitors have counter-balancing effects, but, as they state, the number of competitor actions has to be relatively high compared to focal company actions until they seriously harmfully impact the focal company performance. Moreover, the competitive actions by focal company were found most likely to outweigh the potentially negative consequences of competitor actions. Additionally, other preceding empirical research suggests that more active companies, or companies that are running faster in the words of the Red Queen, relative to their competitors improve their own competitive positions (Ferrier et al., 1999) and increased performance accrue to them (Young et al., 1996).

The Red Queen effect also establishes a link between innovations in achieving competitive advantages and the Schumpeterian thought, since it adds to the Schumpeterian perspective by

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<sup>6</sup> From Lewis Carroll’s *Through The Looking Glass*, where “Alice realizes that although she is running as fast as she can, she is not getting anywhere relative to her surroundings”, taken from Derfus et al. (2008).

<sup>7</sup> In the study performance was measured by return on sales and return on assets in the same year as the actions were observed.

elaborating on the motivating factors behind competitive processes which the Schumpeterian perspective lacks, as was noted by Derfus et al (2008). This motivating mechanism relates to learning from actions and their outcomes. Barnett and McKendrick (2004, p. 540) note that the adaptive process in competitive situation takes place in an incremental manner when a company comes up with a solution to confront competition and by doing so maintains “at least a minimum satisfactory level of performance”. What is noteworthy here is that managers may not be willing to invest in the optimal solution, but rather just try to attain preset expectations. This further intensifies competition and increases the number of competitive actions as competing companies little by little develop their products, and this way incrementally evolve by acting and learning (Derfus et al., 2008, p. 63).

## 2.3 New product introductions and performance

New product introductions (NPIs) are conceived as a part of the larger concept of innovation, which was discussed in chapter 2.1. As was pointed out, new product introductions can be taken as an outcome of innovation process, and thus these introductions portray both competitive actions taken by a company, and at the same time and in a specific way also the overall innovative activity of a company (Hagedoorn and Cloodt, 2003). In addition, it should be noted that the underlying assumption here is that companies introducing new products, or managers making NPI-related decisions, are rational. This means that the introduced products are presumed to have viability in the intended, or possibly in some cases unintended, markets and customer segments.

The newness of a product to be launched plays a key role here. It is important to understand that newness can be viewed from the market or the company perspective, and what is new to the company may not be new to the market. Depending on the research objective these alternative viewpoints on newness may have substantial implications. If the focus is merely on the company perspective, new product introductions give additional insight on company’s endogenous innovative activity and its internal capabilities<sup>8</sup>. If the focus is more on market-

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<sup>8</sup> This is most likely so, despite some level of imitation, replication and introduction of “me-too” products always exists, because in reality it definitely takes some level of innovativeness to be capable to imitate, for example, market leaders or to know when not to do so (Jonsson and Regnér, 2009).

level, the obtained insights may be thought to represent the competitive situation among observed companies.

In accordance with the view of innovations' performance effects in general (e.g. Walker, 2004), the performance effects of NPIs have been found to be significant when market share and the survival of the business (Banbury and Mitchell, 1995), sales (Nerkar and Roberts, 2004; Vermeulen et al., 2005) and return on assets and asset growth (Bayus et al., 2003) have been used as dependent performance variables. With respect to abovementioned ambiguity of innovation typology and quantification of innovations, in the first article NPIs are regarded as important product advances which clearly were of new to the market grade, in the second and third article NPIs are any market introductions of new products or services by focal company, and in the fourth article NPIs are solidified as new combinations of product features, namely, unique brand-CPU combinations in computer manufacturing industry.

In the theory of first-mover advantage NPIs are essential by definition, and therefore the positive performance effects are relatively easily grasped on the grounds of the theory. Practically, when a company launches a new product and it somehow attracts a new customer segment or an existing one by having differentiated product or service characteristics, the company has created a prerequisite (or an asymmetry as was stated by Lieberman and Montgomery (1988) for advantageous position over competitors. As a result, the company has a great potential to attain, for example, leading market share or greater-than-average financial gains (see chapter 2.2.1). If one evaluates the possibly increasing competitive situation after the NPI a little further, it is realistic to assume that this advantageous situation will not last long. As an answer to this, it is arguably logical to try to fight for the advantageous company characteristic and sustain first-mover position by broadening product or service offering or go to a new market still (Robinson and Fornell, 1985), or, simply put, launch even more new or at least incrementally new products. Further, as was pointed out above in relation to concluding on the level of observation, i.e. whether it is on the market level competition or company level internal capabilities, this theory with its practical summation is clearly more on the market-level inspection.

NPIs in the Red Queen effect regime can be thought to increase performance through somewhat parallel ways. Additionally, the complementary perspective is the inclusion of

company's internal capabilities which are here seen as the main source of competitive advantage. In this regime, though, the sustainability of accrued positive performance effects is perceived as more difficult to maintain, and this inevitably leads to competitive races between companies. From this perspective increase in performance is a result of introducing new products and the consequent learning from these introductions and their outcomes (Barnett and McKendrick, 2004). Generally speaking, NPIs are perceived as incremental evolutionary outcomes of focal company's strategic decisions (Derfus et al., 2008). However, in practical terms, NPIs can be seen to act as a means to bring the firm to customers' attention. In other words, when a company launches a product it is expected to attract customers. This launch in turn, especially if successful, prompts competitors to launch their new products in order to secure their own performance and survival. This further leads to the focal company to launch even more and more new products to maintain the customer attraction and the subsequent performance benefits, and a competitive race between the focal company and its competitors has emerged.

Another practical way of seeing this could be related to carrying out a NPI on a new unexploited market, and here a new market can be seen as any, even extremely accurate, level of segmentation of customers. The product here may be marketed already on another market or to another customer segment. When the product is extended on a new lucrative market it certainly attracts competitors to capture profits. This, in turn, urges the focal company to extend new products to even more new markets in order to maintain its competitive position.

The above reasoning in these down-to-earth explanations in relation to the theories of first-mover advantage and the Red Queen effect leads to a conclusion that innovative activity derived from new product introductions increases business performance specifically when this is observed as a market based criterion variable. As the link between innovative activity and market based performance is the main research problem, the discussed literature naturally guides the empirical analysis by illuminating the relevant issues. Though the data handling and the operationalization of research variables are discussed in the next chapter, some clarification on the theory-driven empiricism is in order.

First of all, as the discussed theories suggest, there are latent company characteristics which undoubtedly influence innovative activity and its performance effects. These could show, for

example, as being first-mover in the market and thus having an initial asymmetry compared to competitors (Lieberman and Montgomery, 1988) and as having the motivation to introduce new products which stems from learning from taken actions and their outcomes (Derfus et al., 2008). Further, to account for the effects of these factors it is necessary to have associated data. Alternatively, the stance towards obtaining the data on these latent factors can be also different, since these factors can be thought to explain the magnitude of innovative activity and new product introductions can be thought to be manifestations of these latent factors, as was done by Roberts and Amit (2003). This is also the stance in this thesis with respect to the discussed underlying theoretical mechanisms which hypothesize that greater innovative activity calculated from new product introductions leads to greater market performance. Therefore, in its simplicity the interest in the research data is focused on the heterogeneity in new product introductions and the simultaneous heterogeneity in market performance.

Secondly, competition is in the center of both of the theories, and so it is in the empirical context. While innovative activity indeed may imply some company specific latent factors and these may well play an antecedent role in introducing new products and the pertaining quality of these introductions or, on the contrary, in deciding when not to introduce anything, it should be emphasized that the concept of innovative activity based on new product introductions simultaneously represent company's competitiveness. In this case specifically, it is important to observe other factors that may affect the competitive positions. Thus, the data collection is directed, in addition to taking note of the abovementioned heterogeneity in NPI counts and performance, towards observing other possible competitive actions. Even so, these actions in this thesis are only controlled for, since the main focus is on the innovative activity.

### 3 Research Methods

The analysis of the data was essentially carried out applying linear regression to time-series cross-sectional data. Additionally, and especially in covering the descriptive part of the thesis, simple descriptive methods were used. In the following chapters the collection of research data, the selection of research variables for the quantitative part of the study, and the chosen methods of analysis are discussed in detail.

#### 3.1 Data collection

The empirical context of the study is the mutual fund market in Finland. This market is particularly interesting since most of the research on innovation and especially new product introductions and their linkage to company performance has been carried out in mature market settings (e.g. Banbury and Mitchell, 1995; Bayus et al., 2003; Nerkar and Roberts, 2004), at least to the best of my knowledge.

The Finnish Association of Mutual Funds<sup>9</sup> reports objective and neutral monthly information about the market, such as companies' offerings (i.e. variety of different funds), their categorization into different types, funds' founding dates, assets under management, number of shareholders, different types of service/product fees, names of fund managers, and other specific numeric information about fund performance etc.

The data covers virtually all of the products of all companies. Alas, the reported data is mainly provided by the companies participating in the compilation of the mutual fund report which introduces a minor measurement error. Also, the dimensions of the available data, that is to say whether a fund in question is domiciled in Finland or elsewhere and whether it participates in the compilation of the report or not, further complicates the data collection. Still, these reports formed the foundation for data collection and were used as a sole source of information, with the exception of some market and company specific data which were obtained from other sources for conducting the descriptive analysis.

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<sup>9</sup> Which in September 2009 turned being a part of Federation of Finnish Financial Services and currently in 2012

Although the data is provided on a monthly basis, only one month per year was used in data collection since the changes in fund varieties and companies' performance were not assumed to experience notable changes in a shorter time scale. Though there is some evidence that competitive actions related to new product introductions may take place much faster than one year, depending on many industry and company specific factors (Bowman and Gatignon, 1995), it was concluded that the effects on performance with this setting take more time. Moreover, one-year time scale has been used in similar innovation studies. Roberts and Amit (2003) used one-year time scale for the company performance in their study, and many of the independent variables were aggregated from the data of preceding five years. Likewise, Banbury and Mitchell (1995) used one-year time scale in their study on incremental innovations in the cardiac pacemaker industry and their effect on company market share.

The data collection period was from April 1997 to April 2010<sup>10</sup>, and thus it includes 14 periodical points in time. The companies were selected by calculating the top ten biggest companies by market share, and additionally only the funds domiciled in Finland were taken into account. The funds were observed annually and they all were included in the periodical study. To reduce sampling on the performance variable, the focal firms were included in the analyses every year although not all of them were among the top ten biggest companies throughout the whole period. Moreover, one selection criterion was that the company had to be a member of the Finnish Association of Mutual Funds or its successor. This is because most of the nonmembers offer international funds and valid market share calculations based on assets under management of these funds were practically impossible. Further, the information provided by these nonmembers was usually quite scarce which also supported focusing on member companies. These selection criteria resulted in a total of 20 companies, of which seven entered the market and seven merged with another company during the research period. In each instant, the combined market shares of selected companies was on average 97,2 % (s.d. 1,20 percentage points) of the total market size calculated from the Finnish domiciled fund assets under management of the member companies.

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is called Investment Research Finland (<http://www.sijoitustutkimus.fi/en/>).

## 3.2 Research variables

The selection of quantitative research variables was in essence based on previous research and literature on the subject (most of all Roberts and Amit, 2003). These variables are used to study changes in the mutual fund market in Finland and the relationship between innovative activity and market performance. However, due to some degree of market specificity, additional control variables were developed basing on the previous research in the same mutual fund context.

A set of research variables was constructed to address the research questions. Each company was evaluated with respect to each selected research variable over the entire study period. To examine the evolution of mutual fund market, the product portfolio by a company was dissected into four categories, namely equity funds, bond funds, balanced funds, and hedge funds. The changes in product portfolios were observed throughout the study period. To be exact, each fund of each company was followed from its foundation (or from the beginning of the research period if a fund was already on the market) to its possible kill (or to the end of the research period). Since the fund names in the reports were in many cases unclear, various decision criteria were used in order to link the funds with their altering names in successive years. These included most of all International Securities Identification Number (ISIN) or other identification code which were available in the reports from 2002 onwards. Additionally, and specifically in the years between 1997 and 2001, the fund foundation dates and names of the fund managers were used to identify funds in the case of obscurity with mere fund names in reports.

### 3.2.1 Dependent variable

*Market share change.* Market share change is used as a company performance variable. There are some discrepancies with regard to the relationship of market share with organizational performance measures. For example, the manifestation of a linear relationship between market share and profitability (that is, the greater the market share the more profitable the business) has been questioned by Schwalbach (1991), and he found that large market shares may even be detrimental to profitability. Also, a possibility of industry specificity with respect to the relationship of market share and profitability has been argued (Fraering and



Minor, 1994; Montgomery and Wernerfelt, 1991). Despite these facts, it was decided to be a good proxy to represent overall company performance primarily due to the limitations of the data but substantially also since it has been found to coincide with the expectations of being an antecedent of profitability (see Szymanski et al. (1993) for further description in a meta-analysis of 48 studies). Moreover, the instability of market share of a company due to market regulatory changes or advertisement intensity in the market, which both may change the level of rivalry experienced in the market, has also raised discussion. Of these, advertising intensity has not been found to reduce the leading firm market share instability (Eckard, 1987) but deregulation as an environmental change in commercial airline markets has been found to amplify market share instability (Sandler, 1998). These possible factors are accounted for, at least to some extent, in the selected panel data model. Further, as this dependent variable essentially depicts company growth relative to its competitors, there is a theoretical ground for taking company size into account, as was proposed by Weinzimmer et al. (1998). They suggest that absolute company size has a negative impact on relative growth measures. All in all, relative market share change is expected to be a robust estimator of performance.

In this study market share is calculated by deriving it from assets under management (AUM) of the selected companies in such a way that the sum of all market shares of management companies at each time adds up to 100%. Thus, market share is the total AUM of a company divided by the total AUM of all the selected companies. Another alternative would have been to calculate market share based on the industry sales, as was done in the well-known PIMS database (Buzzel et al., 1975). However, the problem with this calculation was the negative “sales”<sup>11</sup> in some years, and thus the relative figures made no sense. The actual dependent performance variable used, percentage change in market share, was calculated by taking the lagged nature of the impact of both new product introductions and innovative activity on performance into consideration (Bowen et al., 2010; Walker, 2004). More precisely, the relative market share change was calculated by dividing the change in it with respect to previous year with the previous year’s market share, i.e.  $(MS_{t+1} - MS_t) / MS_t$  where MS is market share and  $t$  is time. Considering the independent and the control variables, the data from year  $t$  was applied, except in the case of M&A (explained in chapter 3.2.3). Here, the

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<sup>11</sup> Which actually were economy and market based changes, i.e. stock depreciations due to financial crises, and, of course, partly consequent asset outflows by investors.

values for Sampo for the two first years in operation were found to be of different magnitude compared to other values, and consequently they were regarded as outliers and left out from the analyses. Also another measure, market share change based on the number of shareholders, was calculated analogously for sensitivity testing by dividing the total number of shareholders of a company by the total number of shareholders of all selected companies.

### 3.2.2 Independent variables

*New product introductions (NPI).* Launches of new products, or new product introductions, were calculated annually basing on the start-up date of each fund. The total number of NPIs by a company represents total incremental innovations, in the same manner as Bhaskaran (2006) and Katila and Ahuja (2002) did in their studies. Also Roberts and Amit (2003, p. 109) took account of “discrete modifications to...product/service offerings” in their research. However, different from their setting of counting innovations of different types, namely distribution, process and product innovations, only product-aspect of this classification was used in this present work, due to lack of suitable data in order to incorporate the other two types.

*Innovative activity.* With the aim of assessing companies’ innovative activity, i.e. their propensity to introduce new products, their NPIs were utilized. It has been argued that applying innovation activity as innovation count relative to resources might be a better variable compared to mere NPI count (Acs and Audretsch, 1987). The variable to account for innovative activity was obtained by dividing each company’s NPIs by the total number of funds in that company’s fund selection. In fact, it seems that usually this variable is calculated by dividing NPIs by company size (e.g. Acs and Audretsch, 1987, and Roberts and Amit, 2003), and therefore an alternative measure was used here also to test the sensitivity of this concept. This was operationalized by dividing company’s NPIs from two years ( $t$  and  $t+1$ ) by its assets under management in year  $t$ . The reason why this kind of NPI/AUM measure was not considered here the primary variable for innovative activity is that it may present simultaneity bias with AUM variable explained in the next section of control variables.

### 3.2.3 Control variables

*Company size.* Number of funds and total assets under management (AUM) each year depict the size of the company and are used to spot changes in it over time. As an alternative measure, the number of shareholders is used. This is founded on the fact that AUM is susceptible to many changes (most importantly asset inflows and outflows by investors but also changes in investment market and in the whole economy as well), and possibly in a faster paced manner than the number of shareholders may be. Further, a natural logarithm of total AUM was concluded to be a better proxy for company size for regression analyses<sup>12</sup>. Similar procedure was performed to the total number of shareholders. The gained advantage by logging these variables is a reduction in skewed distribution of the size data (Buzzel, 1981) which might be problematic when calculating the regressions. It is assumed that the size of the company has an effect on the results, the reasons surely being various, but the most explicit of which with respect to this thesis is the hazy existence of the law of proportionate effect as was clarified by Buzzel (ibid, p. 48): “Average growth rates are systematically lower for businesses with larger market shares than for businesses with small shares.” Further, he continues that in the case of “...very rapidly growing markets the growth rate of sales is essentially the same for large and small companies”. Based on these statements, the size of the company may be relevant to the market share changes and needs at least initially to be included in the analysis.

*Market consolidation and non-organic firm growth.* Mergers and acquisitions (M&A) were taken into account since they can dramatically and in many ways change both the structure of market and behavior of individual companies acting in this market. Walter and Barney (1990) suggest that horizontal M&As have several managerial objectives, rather than single dominant one. Especially, according to them, market power and efficiency are the most obvious but still only two goals for M&As. Further, there is some supporting empirical evidence for market share growth being an important consideration in acquisitions, for both to initial managerial objectives and the actual evidenced results after acquiring a company (Ghosh, 2004). Also, what is relevant with respect to company’s propensity to innovate, mergers and acquisitions

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<sup>12</sup> *N.B.* This logging holds true only for the company size measure which is intended to be a resource based, not a market based, variable. In the context of remarking AUM the original unlogged value is referred to.

can even add in innovation capability of a company (Hagedoorn and Duysters, 2002). The way M&As may be relevant to this study, in addition to the increase in managed assets, is that they can change the fund selection of a mutual fund company, and thus have an impact on the variables. Based on the projected previous literature, the effect of M&As is expected to be positive. As they affect, it is assumed, the acquiring company's assets (AUM) without a delay, they were operationalized in the similar manner as the dependent market share change variable, that is ruling in the M&As from year  $t+1$ . The effect on capability to innovate, however, asks for other type of variable definition since its influence presumably turns up on a longer time span. Therefore, in this study this endogenous and possibly longer time span effect is left out.

*Concentration.* Concentration of the fund selection, or more precisely the distribution of the portfolio in equity fund, bond fund, balanced fund and hedge fund categories, reflects the focus (or specialization) of the company. This is measured by Herfindahl-Hirsch index according to the studies of Roberts and Amit (2003) and Damanpour et al. (2009). The effect of concentration of the fund selection is expected to negatively influence the dependent variable, since, at this level of analysis, focusing on some of the fund types is highly prone to changes in economy and customer preferences.

*Product changes.* Name changes of funds were calculated since these have been found to affect asset inflows. Changing the name of mutual fund may result in earning significantly positive abnormal asset inflows in that particular fund, especially if the name change conforms to the fashion of that moment (Cooper et al., 2005). The counted name changes in the data included only radical and distinct changes, and, for example, the changes in the companies' names and simple additions, such as adding "Fund" into the end of the product's name, were excluded.

*Price.* Median management fee of funds in fund family is used as a surrogate variable for the price which in part affects the volume of invested assets in the fund in question. However, the relationship is complex and, at least in the case of actively managed open-end equity mutual funds, it has been found a peculiar negative relationship between fund price and performance, which is contrary to economic intuition (Gil-Bazo and Ruiz-Verdú, 2009). This means that investors invest in low-performing funds with high price, although better alternatives would

be available. Explanations for this puzzling behavior exist. Gil-Bazo and Ruiz-Verdú (ibid.) suggest that the reason stems from the underlying strategic fee setting according to past or expected performance, which in turn is a result of customer and market segmentation by the company. Similar conclusions have been made by Gruber when he suggested the existence of two types of clienteles for open-end mutual funds: sophisticated and disadvantaged ones (Gruber, 1996). Thus, as the academic literature suggests, the effect may be negative on the market share changes, as the investors are expected to be rational. While the data included also other price information, the management fee was selected due to its proportionality to invested assets as it is counted as a percentage of invested assets. This enables meaningful comparisons between funds. Other available price data, namely subscription and redemption fees, are affected also by other factors, such as the customer classification and the duration of holding period, and are thus inapplicable for this study. Similarly, those cases, where the management fee included a return dependent portion, were left out from the calculations of the average measurements.

### 3.3 Descriptive analysis

The first part of the study settles down to some industry characteristics, on the evolution of the mutual fund market as a whole, and, to some extent, on the progress of individual firms in Finland. Thus, the quantitative analytic methods and graphic illustrations used are very straightforward. In addition, the intention is not to delve too deeply into the industrial organization or other theories in the field of economics but to keep innovating in relation to strategic management in the foreground.

The size of the market is calculated from both the total amount of assets under management and the aggregate number of shareholders, both representing the market from the view of mutual funds domiciled in Finland, as was discussed in 3.2. In order to account for the overall economic changes and the importance of the mutual fund industry, assets under management are additionally contrasted with the GDP. This, by mimicking Khorana et al. (2005), is contrasted with some example countries in Europe. Also, the total number of companies and products offered by the companies is used as one additional variable. In addition, to comply with the scope of the thesis, annual counts are calculated in order to assess the aspect of new

product introductions over time. Individual companies are assessed by similar figures, but additionally years in operation, average annual market share and average annual relative and absolute market share growths and M&As are presented.

Furthermore, Herfindahl-Hirschman index (HH index) is applied in examining the concentration of the fund market and also in calculating individual firms' product portfolio concentration, which gives information on their level of specialization. The index is calculated by summing the squared market shares or shares of mutual fund types in the total product portfolio, respectively, according to Acar and Sankaran (1999).

### 3.4 Statistical data analysis

Statistical part of the study was approached by panel data analysis. This was carried out as fixed effects ordinary least squares (OLS) regression. The scope was to examine the relationship between innovative activity and market performance during the observed time span.

#### 3.4.1 Panel data analysis

The reason for using panel data analysis is the possibility to combine time series with cross-sections, and therefore by utilizing both of these dimensions have richer data (Greene, 2003). The analysis is a form of longitudinal data analysis which is used especially in social sciences in studying differences between cross-sectional units of observation (spatial dimension) with periodic observations of a set of variables characterizing these cross-sectional units over time (temporal dimension) (Yaffee, 2003). In this thesis, the time-series cross-sectional data consists of individual mutual fund companies (altogether 20 companies) which are cross-sectional units and 14 consecutive years in which the variables of interest (discussed in chapter 3.1.) are sampled once every year. Therefore, the pooled data set in its entirety forms a panel of 280 cases. However, since all the companies are not operating the whole time, the panel includes missing values and the data set is referred to as an unbalanced panel, and eventually it consists of 189 observations. Further, also some other variables of interest have missing values due to lack of information in the original data, and, in effect, the number of

observations is reduced to 163. Although, it is ideally desirable to have the whole data without missing values which is called a balanced data set, this imbalance does not prevent from performing the analysis.

In general, the types of panel data analyses can be divided into fixed and random effects models. To be precise, there is also a special case where neither spatial nor temporal dimension have any significant effects and the data can be used as pooled (Yaffee, 2003), and also more complex methods, such as dynamic models or random coefficients model. For further and comprehensive discussion on these and other methods, see Greene (2003) and Woolridge (2002). The difference between fixed and random effects models is the assumption of the variation across the cross-sectional units to be random and uncorrelated with the included independent variables in random effects model whereas in fixed effects model each cross-sectional unit is assumed to have its own individual characteristics which may or may not affect the independent variables (Greene, 2003, p. 287). In other words, when using fixed effects model, it is assumed that some possibly unobservable individual factor(s) (i.e. unmeasured heterogeneity) can impact or bias the independent or the outcome variables, and this needs to be controlled for. As a result, when using fixed effects model the exploration of the relationship between independent variables and dependent variable is limited to within the cross-sectional unit (e.g., as in this case, one management company). Despite the loss in efficiency when the variation across different cross-sectional units is ignored, the gained advantage is that the unobservable individual factors are controlled for, and possible and even more serious problem of omitted variable bias can be avoided (Jacobson, 1990; Woolridge, 2002).

Another differentiating assumption between the two methods is the incorporation of time-invariant characteristics (e.g. location or firm type may be such characteristics that most likely remain unchanged during the research period) in the analysis. In random effects model it is accepted to include such characteristics whereas in fixed effects model all the variables are assumed to be time-variant since otherwise it would be impossible to distinguish time-invariant observable individual factors from time-invariant unobservable individual factors (Woolridge, 2002, p.266). Also, in the fixed effects model the assumption is that the time-invariant characteristics, which are part of the unobservable individual factors, are not correlated with other individual characteristics. However, if the unobservable individual

factors are not time-invariant but vary over time and may or may not differently affect the independent variables (i.e. with all other fixed effect conditions applying), the omitted variable bias still exists.

By accepting the above-mentioned circumstances of both avoiding omitted variable bias at the expense of efficiency alike assuming all the included variables to be time-variant and unobservable individual factors to be time-invariant, the chosen panel data analysis method is fixed effects model which is more robust (Woolridge, 2002) than the random effects model and therefore suits better in this situation with the available data. Still, this model is not without cons, because the extent of cross-sectional units may eventually decrease the statistical power of the analysis through multicollinearity, heteroskedasticity or autocorrelation (Yaffee, 2003).

### 3.4.2 Least squares dummy variable regression

The actual calculations for the panel data analyses were performed using ordinary least squares (OLS) regression with IBM SPSS Statistics package. OLS is a powerful and flexible method for analyzing associative relationships between a metric-dependent variable and one or more independent variables (Malhotra and Birks, 2007, p. 581). Regression can be used, for example, to determine whether an independent variable explains a significant variation in the chosen dependent variable and to examine the magnitude of this relationship, if a relationship exists. However, it is important to bear in mind that such relationship does not necessarily imply causation. For the analysis purposes of this thesis the examination of the existence of possible relationship is sufficient and, on the aforementioned grounds, the calculations needed to carry out panel data analysis are based on regression methods, which can be regarded as common practice (see e.g. Greene, 2003, chapter 13).

The OLS regression model used to calculate the fixed effects is specifically called least squares dummy variable (LSDV) model (Yaffee, 2003). This model can further be defined to include either spatial or temporal dimensions (one-way model), or both of these (two-way model). Both of the dimensions are operationalized as dummy variables,  $i-1$  for spatial dimension and  $t-1$  for temporal dimension, where  $i$  represents the number of cross-sectional units and  $t$  represent the number of time periods. In practical terms, this means leaving one



company out of the regression as a reference, thus also avoiding perfect collinearity (Yaffee, 2003). The general regression model can be presented as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{1,it} + \dots + \beta_k X_{k,it} + \gamma_2 E_2 + \dots + \gamma_n E_n + u_{it},$$

where  $Y_{it}$  is the dependent variable ( $i$ =cross-sectional unit and  $t$ =time),  $X_{k,it}$  are the independent variables,  $\beta_k$  are the coefficients for the independent variables,  $u_{it}$  is the error term,  $E_n$  are the cross-sectional units as dummy variables, and  $\gamma_n$  are the coefficients for the cross-sectional unit dummies. It should be noted that, contrary to this general equation, the regression model in this thesis uses lagged dependent variable (and also lagged control variable in the case of M&As), and therefore the time for them is actually  $t+1$ , as was explained in chapter 3.2. This model only includes the effects of individual units, and time effects are left out from the calculations because it was concluded that there was not any unexpected group, or management company, specific characteristics change that may lead to temporal, and hence notable, changes in the dependent variable.

## 4 Results and discussion

In this section, the results of both descriptive and statistical analysis are presented. Additionally, this section includes discussion on the results in the light of previous research, where applicable. As the aim stated in the research questions is on one hand to explore the evolution of mutual fund market in Finland mostly from the perspective of new product introductions and on the other hand to examine the effect of innovative activity on performance, both of these parts are dealt under their own subheadings for the sake of clarity. Moreover, the former part serves partly as an introduction to the research context of the second part of statistical analysis.

### 4.1 The emergence of mutual fund market in Finland

Here, the evolution of the mutual fund market is explored (the research question 1) at market and company level by highlighting the most significant changes and advances at these levels.

#### 4.1.1 Market on the increase

The mutual fund market is part of the bigger whole of investment market where different products are offered to customers by companies selling them. While extremely obvious, this reminder puts the mutual fund industry in a relationship with other investment vehicles available to investors, whether households or institutional. As a matter of fact, in Finland the level of mutual fund investments in comparison to total financial assets has been somewhat low among households (table 1), whereas in Sweden the share of mutual funds of households' total financial assets has been much higher (data not shown). However, the difference between these two countries has diminished markedly at the same time as the industry has grown in Finland, and this represents the growth in demand for mutual funds among households<sup>13</sup>. Where individual investors, or households, form a great deal of customers' mutual fund assets, even greater deal is comprised of institutional investors such as pension funds and insurance companies, through which also households invest in mutual funds

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<sup>13</sup> Note that this data includes the total mutual fund investments by households as is reported by OECD, whether in Finnish or foreign domiciled mutual funds.

indirectly; the share between households' and institutional investors' holdings is easily calculated by subtracting the share of households from the total AUM. Here, the problem is the total market AUM since it cannot be calculated based on the data, but only based on the domiciliation in Finland, and there is no data available for the institutional investors' total mutual fund investments as is for the households provided by OECD (and for Finland, by Statistics Finland). The figures for demand side of the market need to account for the foreign domiciled funds promoted in the national market by nationally operating companies as well. Thus, figures showing the growth of the size of the total market (nor supply or demand side of it) accurately or in full effect cannot be presented. Roughly speaking, though, recently the split has been somewhere close to 20% for the households and the rest for the institutional investors. However, the conclusions of the growth of the demand and the institutional investors being the larger group by share can be made with certainty.

It is also worth mentioning that abovementioned straightforward comparisons between different market areas in the case of mutual funds are highly biased by the local laws and regulations which have a great impact on both demand side characteristics via taxation and investor protection and supply side via regulation of competition and starting up a fund, as was pointed out by Khorana et al. (2005). For example, in Sweden the first Investments Funds Act came into effect in 1974 whereas in Finland this happened over ten years later in 1987, and, according to Khorana et al. (ibid.), the size of the mutual fund industry is attributable to the age of it. Thus the mutual fund market in Finland can be taken to have been evolving to match the Swedish and to some degree the European markets. The development of abovementioned figures, if taken to be standing for industry growth in Finland, seem to be coherent with these former findings, although the onset of growth took place near the turn of the millennium, more than ten years after the announcement of the legislation. The reasons for this relatively long lag are most likely somehow due to the economic downturn during the most of the 1990s. For more information on the legislative issues in the global mutual fund industry and other market specific factors influencing the size of the industry, see Khorana et al. (2005).

In order to maintain the importance of the industry to the national economy in perspective, the total level of mutual fund investments with respect to GDP is presented also in table 1. It is noteworthy, that this figure depicts only, as is justifiable, the AUM on the basis of

domiciliation and represents the growth of the importance of the industry on national level. As can be seen, over the years the mutual fund industry has become an important part of financial sector in Finland as well as in Europe, and the importance of it in Finland has stabilized to match up to the European levels. As for the picture with respect to Europe, the investment fund industry in Finland represents roughly less than 1% of the total industry net assets in Europe (0,5% in 2003 to 0,8% in 2010), Luxembourg and France dominating with 27% and 18% shares in 2010, respectively. Still, these few relative size based facts are not to downplay the industry or its role in financial sector in Finland, especially when the growth is taken into account, but rather to put it in proportions in the national and European economies.

**Table 1.**

Evolution of mutual fund market in Finland in 1997-2010.

<i>Variable</i>	<i>Year</i>													
	<i>1997</i>	<i>1998</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>
AUM (billion eur) <sup>#</sup>	2.6	3.9	6.1	13.1	13.8	15.3	18.1	25.7	35.7	50.3	63.1	56.4	41.6	56.2
AUM growth <sup>#</sup>		54 %	54 %	117 %	5 %	11 %	19 %	42 %	39 %	41 %	25 %	-11 %	-26 %	35 %
Households' mutual fund investments of total financial assets	1.3 %	1.9 %	3.3 %	3.9 %	3.9 %	3.7 %	4.5 %	5.7 %	7.3 %	9.1 %	8.9 %	4.9 %	6.2 %	6.5 %
AUM/GDP	2 %	4 %	5 %	10 %	11 %	11 %	13 %	17 %	23 %	32 %	38 %	32 %	25 %	33 %
<i>Sweden*</i>						22 %	26 %	28 %	35 %	45 %	42 %	26 %	40 %	54 %
<i>Germany*</i>						36 %	39 %	39 %	44 %	44 %	44 %	37 %	43 %	46 %
<i>France*</i>						59 %	65 %	68 %	75 %	85 %	82 %	69 %	76 %	73 %
Shareholders (thousands) <sup>#</sup>	66	112	234	600	816	925	1080	1420	1640	2038	2346	2347	2243	2513
Firms <sup>#</sup>	13	13	15	14	14	13	14	14	14	13	13	13	13	13
<i>Firms total</i>	18	20	28	31	36	38	36	39	39	40	39	44	45	46
Share of 5 biggest <sup>#</sup>	77 %	77 %	76 %	72 %	74 %	77 %	79 %	77 %	79 %	82 %	80 %	80 %	78 %	77 %
HH index of industry <sup>#</sup>	0.151	0.156	0.165	0.144	0.153	0.159	0.164	0.166	0.184	0.205	0.208	0.187	0.164	0.177
Products <sup>#</sup>	55	79	120	176	233	251	285	295	329	382	415	444	428	420
NPI <sup>#</sup>	6	25	37	56	53	30	36	19	41	68	53	31	22	18

Sources: Mutual Fund Reports, Eurostat and Efama (and partly own calculations based on these).

\* The data available only for 2002-2010.

<sup>#</sup> Only the observed companies are included.

#### 4.1.2 Market level evolution

Indeed, the most outstanding change is without a doubt the increase of the whole industry and the demand for these kinds of investment products in Finland since 1997, the beginning of the observation period, with the exception of year 2009 (table 1). This is also one of the main motivations for this thesis, as was pointed out in the introduction. It should be noted that, where the size of the industry and its increase can be seen using many variables (assets under management, number of shareholders, number of companies in the industry, number of products offered, new product introductions), the changes in assets can result from various sources. The most important sources are net investments (asset inflows and outflows by investors) and development of the investment market or the economy in full, as was clarified in chapter 3.2. As a matter of fact, the ample effect of investment market changes can be seen clearly in the decrease in total AUM, and to some extent in the loss of total number of shareholders, in 2009 which was a result of the financial crisis in the fall of 2008 (another one was experienced in 2001-2002 as a result of IT bubble). Also, the effect of this type is two-fold since the total AUM decreases by both losses in asset value and customer redemptions, and thus the negative effect is self-fueling. Despite this fluctuation in the total AUM, the overall growth of the industry has been on average 26% on the annual basis during the research period. This growth plus the resulting competition have spurred new product introductions and innovative activity among the companies, as can be seen in the growth of number of mutual funds and new mutual funds in table 1.

A significant character of the industry is its concentration, which has risen slightly during the observation period. Following Khorana et al. (2005), the aggregate of five biggest companies' market shares was 77% of the AUM in 2010, the lowest proportion being 72% in 2000 and the highest 82% in 2006. However, this connotes no increase in average annual growth rate of their aggregate market share over the research period. Further, the composition of the group of the five biggest has changed a little during the years indicating some turbulence in the industry (Matraves and Rondi, 2007), but Nordea Bank (former Merita) has remained the market leader almost for the whole period, except in 2003 when Sampo Bank's market share was bigger. The concentration in the industry is even more apparent when only the two biggest firms' market shares are considered; the sum of these account for most of the

change/increase of the five biggest companies' figures, and the average annual growth rate of two biggest companies' aggregate market share is 1,37%. Moreover, the changes in companies' relative positions illuminate a very distinct rise of two companies, namely Osuuspankki Bank and Sampo Bank, which were numbers two and three in 2010, respectively. All in all, although the industry has not undergone greater concentration as such during the observed evolutionary phase, somewhat similar observations on the tendency of big banks becoming the rulers in mutual fund industry have also been made in other market areas, for example in Germany especially before the emergence of online brokers (Krahn et al., 2006).

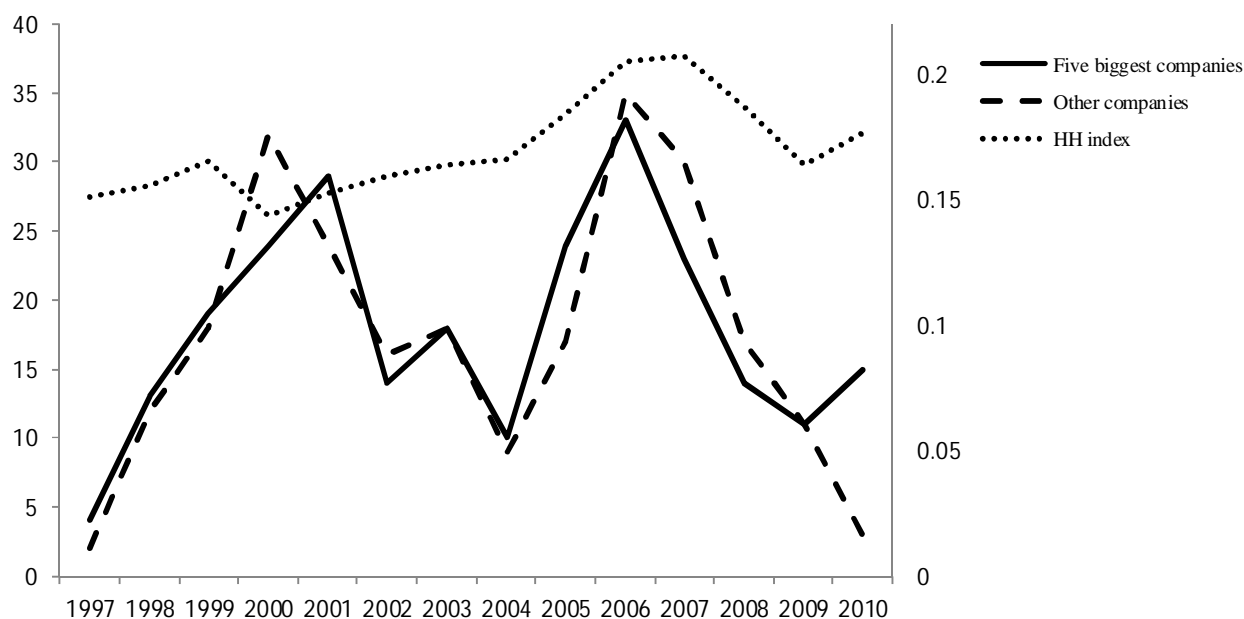
By viewing another measure of concentration among the observed firms, HH index (of industry), the changes have been even less dramatic (table 1). Nevertheless, there is some alteration in the index, and this alteration goes somewhat hand in hand with the changes of market share of the biggest companies. This is natural because changes in market share of the five biggest lead to opposite changes of the market share of the others due to laws of proportionality, unless the number of companies in the industry changes. Obviously, though, the transferred market share can be divided by the other companies by different ways, but in this case where the biggest five hold their grand position so firmly the changes in HH index tend to be small. Furthermore and interestingly, the changes in both concentration measures, the market share of five biggest companies and HH index, follow on a rough level the changes in the market size development, portrayed by AUM growth. This may show that the downturn has a tendency to decrease the concentration, indicating increased ambiguity in the market.

Though the observed decreases in concentration may, in fact, be just results of greater losses by larger companies due to financial crises, there is a link between innovations and market concentration as well, as was suggested by Geroski and Pomroy (1990). They find that innovations may reduce the level of concentration in market. Here it should be seen as larger number of NPIs at those times<sup>14</sup>, and as a matter of fact that kind of observation can be made on the basis of company size. In figure 1, the NPIs of smaller companies is greater than the count of the biggest five's NPI in 2000 when a slight decrease in industry concentration was

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<sup>14</sup> However, the de-concentrating effect of innovations may well be over the observed one year time scale.

observed. Further, during 2006-2008 smaller companies introduced more new products and, at the same time, the industry was de-concentrating. However, it should be noted that, according to Geroski and Pomroy (ibid.), the effect can also be working through another direction; the lowered market concentration may lead to greater innovative activity. In spite of this, here the NPIs seem to decrease market concentration, particularly during 2006-2008.



**Figure 1.** Annual new product introduction counts by company size (the left vertical axis) and the industry concentration (HH index, the right vertical axis).

When discussing an innovation related topic, technological development during the years cannot be overridden in the context of industry evolution. However, the used research data does not give in to analysis basing on it, since it completely lacks this type of company information. Thus, only general level of development in the industry can be covered. Undoubtedly, the changes in electronic commerce have facilitated the communication between the supply and demand sides of the business and the advances in information processing have accelerated the “back-office” work related to product development and other business operations. Benjamin and Wigand (1995) portray the possibilities of value-chain changes via electronic markets well before the same changes have even had the possibility to transform the mutual fund industry in Finland. This is not to say that these changes exclusively cultivate the Finnish industry but to shed some light on the inevitable development that has had a great influence here, as has also happened elsewhere. A great



example might be Schwab with their Onesource mutual fund market which revolutionized the pricing policies, and later steps of promoting and selling investment funds online through their website. The development of these so-called fund marketplaces has enabled the emergence of new smaller players, as has happened in Sweden<sup>15</sup>.

Further, as mutual fund industry is one sub-category of financial services, and especially as the technological advances cover to large extent the financial industry as a whole, some approximations can be found from, and the reader is directed to, Barras' (1990) case study on the role of technological possibilities for innovation and their adoption in financial industry at industry level. In this study innovations are categorized as product and process innovations<sup>16</sup> which occur at different phases of the evolution of industry, suggesting the importance of adopting both kinds for the company to be able to maintain its competitive edge. It might be so also in the mutual fund industry that the companies which innovate and employ new processes along with introducing new products have an advantage over the companies which only introduce new products.

#### 4.1.3 Company level evolution

Table 2 shows figures representing the most important average annual changes within the observed companies in the research data (for brevity, the longitudinal data is not shown). It is apparent that the size of the AUM of individual companies has grown at the same time as the whole industry has grown. In 1997 the AUMs of the companies varied between 12,4 and 666,0 million euros and in 2010 the equivalent figures were 697,3 and 15242,5 million euros, and clearly the difference between the greatest and the smallest company has decreased, relatively speaking. The same applies to shareholder growth figures. Also, the average fund size has tripled during this time, but average AUM per shareholder has dropped to two thirds of the value in the beginning. This is because the average of number of shareholders per mutual fund has grown to almost six-fold.

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<sup>15</sup> See [http://fondbolagen.se/Documents/Fondbolagen/Studier%20-%20dokument/30\\_Years\\_With\\_Funds.pdf](http://fondbolagen.se/Documents/Fondbolagen/Studier%20-%20dokument/30_Years_With_Funds.pdf) (retrieved on 29.4.2012).

<sup>16</sup> The earlier presented categorization by Damanpour and Gopalakrishnan (2001) is the same, representing difference between innovations in operations, which are not necessarily even visible to customers, and actual product or service innovations, which are no less than salable to customers.

**Table 2.**Average annual figures (except *Acquisitions* which is count data for the whole period) for studied companies.

	<i>Years in operation*</i>	<i>Annual AUM growth</i>	<i>Annual shareholder growth</i>	<i>Market share</i>	<i>Market share absolute annual change</i>	<i>Total number offunds</i>	<i>Sum of new product introductions</i>	<i>Acquisitions</i>	<i>HH index of product portfolio</i>
Alfred Berg	14	10.2 %	28.7 %	5.29 %	-1.15 %	9.6	0.8		0.39
Gyllenberg	14	21.5 %	32.1 %	9.03 %	-0.63 %	17.7	1.6		0.31
Osuuspankki	14	48.6 %	41.7 %	15.83 %	1.29 %	36.3	3.9	1	0.39
Nordea	14	33.4 %	36.5 %	27.89 %	0.01 %	41.2	4.7		0.39
Sampo <sup>#</sup>	12	359.9 %	1803.1 %	15.80 %	1.43 %	51.5	4.7	2	0.39
Evli	14	23.9 %	20.7 %	7.66 %	-0.58 %	22.1	3.2		0.35
Handelsbanken	13	70.8 %	92.8 %	2.02 %	0.30 %	17.7	3.2		0.46
Aktia	14	33.9 %	28.8 %	2.95 %	0.06 %	16.8	2.2		0.41
Carnegie	12	14.5 %	20.4 %	1.09 %	-0.23 %	8.0	0.6	1	0.37
Icecapital	8	40.0 %	29.7 %	1.15 %	0.09 %	13.3	3.3		0.45
FIM	14	77.0 %	87.8 %	2.57 %	0.24 %	17.1	2.4		0.51
Seligson&Co	13	67.2 %	85.9 %	1.73 %	0.08 %	14.0	1.9		0.49
Arctos	2	40.1 %	18.9 %	2.64 %	-0.26 %	7.0	1.5		0.31
Diana	3	-7.8 %	24.1 %	1.82 %	-0.92 %	3.7	0.3		0.36
Conventum	3	51.5 %	72.8 %	1.81 %	-0.12 %	12.3	1.7	2	0.27
Pohjola	4	67.0 %	64.1 %	3.98 %	0.83 %	24.8	3.8	1	0.31
Tapiola	10	40.3 %	65.6 %	2.10 %	0.23 %	18.4	2.1		0.37
Erik Selin Rahasto Oy	1	-	-	6.06 %	-	4.0	0.0		0.63
Mandatum	3	119.1 %	117.0 %	3.34 %	0.63 %	13.3	3.7		0.28
Leonia	4	93.4 %	148.9 %	8.86 %	0.86 %	9.8	3.8		0.46

Note. <sup>\*</sup>If a company does not have mutual funds domiciled in Finland it is regarded as being not in operation (see text for further information).<sup>#</sup>The data includes the outliers which are left out in the statistical analysis.

In the case of longitudinal data, a reasonable way to examine dispersion in competitive positions among companies in the industry along with its evolution is to use relative figures, such as market share as was discussed in the literature review. The average annual absolute market share changes during the whole observation period suggest that no big shifts in the competitive positions have been witnessed, except the rise of Osuuspankki and Sampo and the fall of Alfred Berg, Gyllenberg and Evli. Both of these rising companies sought and gained market share growth through acquiring another company, and Sampo did this actually twice which apparently had a great effect on its market share. The growth of these companies means that the market shares grew three-fold for Osuuspankki and over 200 times for Sampo during the years in operation. Moreover, as an interesting fact, the average change of the market leader, Nordea, is literally zero during the observation period. The negative and quite large figures for Alfred Berg, Gyllenberg and Evli also catch attention. Of these, Alfred Berg has transformed the domiciliation country of its funds from Finland to another country, and this clearly is one big reason for the decline in its market share. All in all, the lack of greater shifts in competitive positions on average is no surprise since, as was seen in the previous section, the industry has been and has become even more firmly dominated by few big companies.

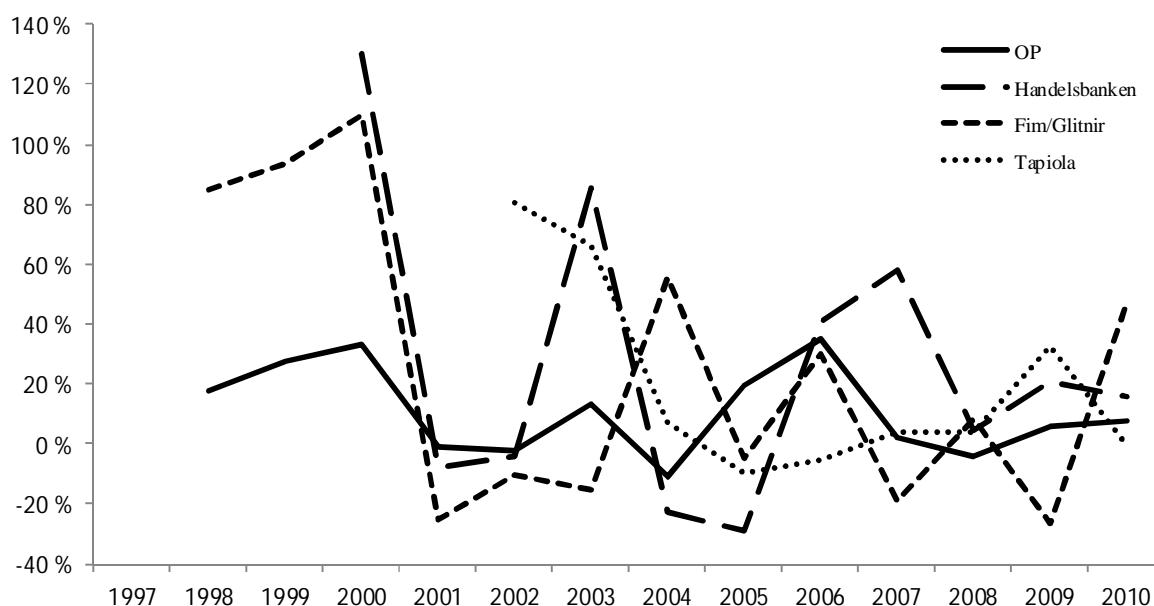
What seems to be the same between the three biggest companies, Nordea, Osuuspankki and Sampo, is the breadth of their operations in the financial industry, since they all offer banking services, insurance services etc. Similar types of retail networks dominated by big banks are not unheard of in other mutual fund markets (e.g. Krahnen et al. (2006)). This diversification makes sense in the light of utilizing their existing distribution network and available resources<sup>17</sup>, as well as economies of scale (Buzzell et al., 1975). The smaller companies, on the contrary, may benefit from the differing customer preferences and demographic factors by offering personalized financial services, such as private banking, for wealthier customers. This can also be seen as a possible existence of sub-markets inside the total mutual fund market in Finland.

All these seemingly small average changes in competitive positions over the years, however, do not mean that there are no changes and competition from year to year. As a matter of fact, the heterogeneity in terms of absolute market share changes annually is quite large even for

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<sup>17</sup> These might include, in addition to the obvious financial assets, software and other kinds of IT infrastructures.

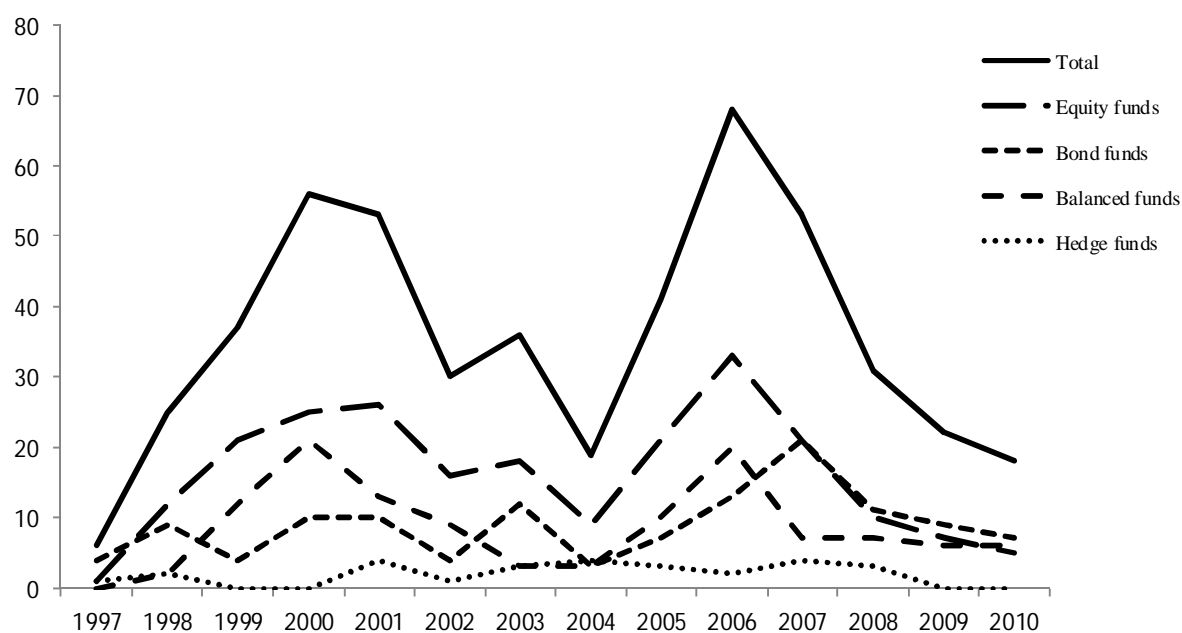
the largest companies, and if the proportional changes (which is the dependent variable for the statistical analysis) is considered, the heterogeneity among the companies annually is even larger. Figure 2 represents this (only some relevant companies are portrayed for the sake of clarity). With respect to this observed heterogeneity, the statistical analysis in the next section will cover it in more detail.



**Figure 2.** Annual relative market share changes (=dependent variable) of four different sized companies.

The product portfolios in this specific industry tend to be diversified (the HH index in table 2), which is only natural since the offered products are somewhat easily set up, but not readily imitated even though there are some arguments for this as well (Makadok, 1998). Although this level of analysis does not allow more accurate observations to be made, there seems to be a slight tendency for the lower mid-size companies (namely Icecapital, FIM and Seligson&Co) to be more specialized, and this can be seen as higher HH index relative to other companies, and specifically to the biggest ones. The data illustrates that these companies focus on equity funds which is the most common fund type in the market, whereas the biggest three companies have considerably higher relative shares of balanced funds and even hedge funds (Sampo). In spite of the ease of introducing all fund types, Eggers (2012) found that as the fund company's concurrent portfolio of new products broadens, the quality decreases, and the contrary applies in the situation when company focuses on one niche and

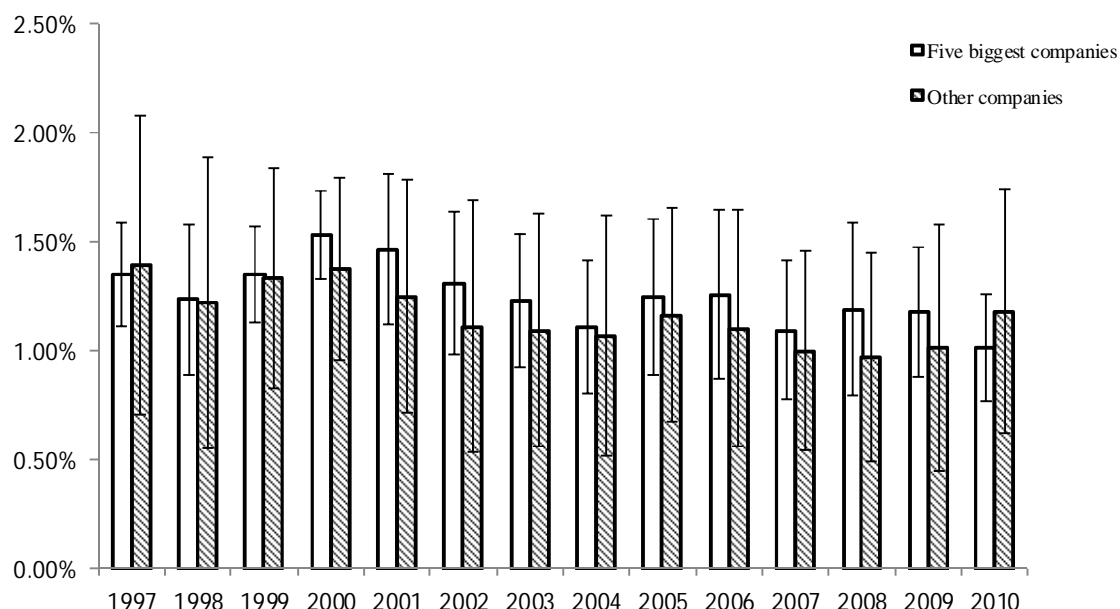
introduces more products in within this niche. In that study, however, the level of analysis was much more accurate compared to this current thesis. Moreover, depending on the economic situation there surely should be some fluctuation in demand for different fund types. Some indication of this can be seen in figure 3, which shows the annual number of new funds introduced in the market by category. Equity funds are by far the most commonly introduced fund type, and balanced funds are the second. The number of the introductions for these types is higher when the industry is undergoing rapid growth and decreases just after the downturns. Also, it seems that the level of introducing new equity funds and balanced funds is more prone to the changes in economy, which is understandable. The number of new bond funds appears to grow, relatively speaking, in and after economic downturns. Introductions of new hedge funds are moderate but seem to be greater towards the end of the research period (except the two final years after the 2008 crisis).



**Figure 2.** Annual new product introductions by fund type category.

With respect to the development of management fees collected by the companies, one trend can be seen. The median prices calculated on the grounds of total product portfolio tend to decrease, suggesting some level of price competition. However, what is notable is the higher level of prices for the biggest companies, and this can be seen in figure 4. For example, the median management fee of Osuuspankki is almost three times bigger than the lowest fee of

Seligson&Co in 2010. The explanation for this might be customer segmentation, but also the exploitation of the market position (Buzzell et al., 1975). Also, possible emergence of more complex pricing styles cannot be ruled out.



**Figure 4.** Annual averages of median portfolio prices by two company size categories. Standard deviations are shown in bars.

Technological development at company level as a source for greater competitiveness naturally coincides with the mutual fund and whole financial services industry level advances, as was pointed out in the previous section. However, as said, due to data limitations systematical company level analysis is practically impossible. Despite of this, what is certainly different between companies is the speed in adopting these advances, and from this stem the possible competitive differences. One example, which already was highlighted, is the introduction of online services and market places. The larger, and perhaps subsidiary companies of even larger international parent companies (such as Alfred Berg and Sampo), have an advantage in using larger information and resource base also with regard to implementing new advances in the industry. There is also some evidence to back up the fact that this type of information flow within financial conglomerates is also extended to privileged inside-information in order to experience extra-performance (Massa and Rehman, 2008).

## 4.2 The relationship of innovative activity and performance

In this section the statistical relationship of innovative activity and performance is inspected (the research question 2). First, the descriptive statistics of the incorporated variables is presented and then the results of panel data analysis and related regressions are shown and discussed.

### 4.2.1 Descriptive statistics

The used variables and their pairwise correlations are shown in table 3. The values indicate high and statistically significant correlations between some of the independent and control variables (variables from 3 to 10), and this introduces a possibility for collinearity (see 3.4.1.). However, the correlations do not exceed the critical value of  $r=0.8$  noted by Farrar and Glauber (1967) and, in relation to this, the most striking pairwise sample interdependence amongst the independent variables is absent. Besides, it should be marked that table 3 includes all the variables, yet not all of them are used in the following regression analyses simultaneously. Another measure for detecting collinearity is the variance inflation factor (VIF) obtained when doing the regression analysis by SPSS. This procedure takes the multivariate nature of this usually adverse phenomenon into account as well, and therefore it could be regarded as the preferred method. The comments on VIFs and multicollinearity are to follow in the following regression analysis section. At this point, however, the presence of multicollinearity is not considered a problem but nevertheless its possible existence should be recognized when interpreting the results.

**Table 3.**Descriptive statistics and correlations of the regression analysis variables ( $N=163$ ).

Variable	Mean	S.d.	Max.	Min.	Correlation with:								
					(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Market share (%)	7,82	8,67	33,54	0,59									
(2) Market share change (%)	7,41	40,30	348,97	-69,67	-0,051								
(3) Company size	6,7	1,4	10,0	2,5	0,676**	-0,296**							
(4) NPI	2,8	3,0	20	0	0,338**	0,179*	0,339**						
(5) Competitors' NPI	34,4	15,4	68	4	-0,097	-0,053	0,180*	0,219**					
(6) Innovative activity	0,16	0,19	1,00	0,00	-0,047	0,464**	-0,268**	0,573**	0,055				
(7) Competitors' innovative activity	0,16	0,09	0,34	0,04	0,022	0,052	-0,338**	0,066	0,409**	0,339**			
(8) HH index	0,40	0,09	1,00	0,26	-0,205**	0,088	-0,304**	-0,148	-0,049	-0,013	-0,043		
(9) Name changes	0,79	2,11	18	0	0,313**	-0,040	0,343**	0,092	0,092	-0,083	-0,059	-0,082	
(10) Median management fee (%)	1,20	0,46	2	0	0,303**	-0,022	0,105	0,123	-0,040	0,017	0,180*	0,031	-0,001

Note. \*  $p < 0.05$  and \*\* $p < 0.01$  (Pearson correlation, two-tailed)

Market share variables (1) and (2) are lagged by one year.



There are some interesting findings with respect to correlations. The first one to catch attention is the negative and statistically significant correlation of the dependent variable, market share change, with company size. The straightaway conclusion is that the size of the company determines its market performance in an inverse manner, i.e. the bigger the company one year, the lower its market share change the next year. Although this, based solely on the correlations is in essence correct, one has to remember that the performance is measured by market share change, which inevitably reaches its limits at some point when company grows<sup>18</sup>. Another remark related to this is the construct of these variables since they both are calculated from the same company's AUM. In fact, this might imply possible simultaneity and ultimately an endogeneity problem in the regression analysis (Wooldridge, 2002). However, as was discussed in chapter 3.2., the dependent variable is calculated to represent the relative change in market share, not the absolute magnitude of it since absolute magnitude of change is assumed to vary on a different scale with bigger companies. Thus, in principle, the variables are independent and the simultaneity is not considered probable, leading to the conclusion that the correlative relationship between these two variables, the dependent variable and company size, actually can be regarded as reverse in this research setting.

The positive and statistically significant correlation between company size and new product introductions indicates that the number of NPI by a company gets bigger when company size grows. When innovative activity is contrasted against company size the correlation turns negative, being still statistically significant. The interpretation is that the bigger the company, the smaller its innovative activity and, in reality, the less is the ratio of new products in its product portfolio. Identical findings of decreasing new product introductions per company's assets (or its size, the ratio representing innovative activity) when company size grows have been found by Audretsch (1995b). Similarly, what is not shown in the table, there is a negative and statistically significant correlation between company size and NPI per assets under management.

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<sup>18</sup> Even a critical level of market share, 65-70%, has been proposed by Schwalbach (1991), beyond which the return on investment (ROI) decreases.

NPI and innovative intensity are positively and significantly correlated with competitors' respective figures. This is expected because the variation in NPIs is related to market specific factors, such as growth and concentration as was discussed earlier in the context of market evolution. In addition and even more importantly, the competitive race forces companies to act and counter-act, as proposed in the theory of Red Queen effect (Derfus et al., 2008) which was covered in the literature review, and this can be seen as the number of NPIs of a company and its competitors' covarying to some degree.

The concentration of the product portfolio (HH index) is negatively and significantly correlated with market share and company size. This means the bigger the market share or the company size, the lower the concentration (and thus, the greater the diversification) of the company's product portfolio. This is somewhat expected since larger market share and bigger company size mean larger product portfolio, based on the data in question and preceding research (see e.g. Bodson et al., 2011), and this, logically thinking, translates to diversification. Moreover, diversification of product portfolio may be something beyond just simple correlation, namely a result of greater demand which the market has witnessed, and therefore a supply of greater variety of different products to fulfil differing customer needs. This in turn may result in larger market share and bigger company size. Specifically in the case of vigorously growing market this seems plausible but whether this is the case is impossible to say in consequence of a mere correlation. Further, with respect to NPI, the HH index has quite high but not statistically significant negative correlation with it, which may be an exiguous indication of determined diversification of product portfolio by introducing new differing products, but this is also subject to the evolution of both market and companies operating in it.

Name changes correlate positively and significantly with company size measures. As was stated, larger product portfolio means more product changes, and therefore this correlation is well conjectural. The correlation of name changes with NPI or innovative activity is non-significant.

The coefficient of median management fee is positive and statistically significant with respect to the market share of a company. The same holds true in the case of mean management fee and the number of funds in portfolio which are subject to return dependent portion in the

management fee (data not shown). This correlation might be a sign of exploiting the heterogeneity in investors, the current customer base and the first-mover advantage related customer switching cost. On the other hand, this might be related to the company size and its market power. Buzzell et al. (1975) have concluded that larger market share tends to mean larger prices, but it is not ultimately conclusive that if in the case of mutual funds this is linked to better quality of the products offered (e.g. in the form of greater profits earned from them) and thus possibly a greater demand, as was stated by Buzzell et al (ibid.). Actually, the contrary might be also true as was found by Gil-Baso and Ruiz-Verdú (2009) and Gruber (1996). Also, and not surprisingly, the correlation between the fee and the NPI is positive and fairly large by size, but not significant. Despite the lack of statistical significance this possibly indicates that new products are charged more, albeit this is interrelated to the abovementioned observation that bigger companies that introduce more new products have larger prices as well. Further, in relation to competitors' innovative activity the correlation is positive and significant. However, there is no sound explanation why this kind of correlation would exist, and it may as well be just a statistical artifact.

#### 4.2.2 Regression analysis

The estimations for the panel data regressions are presented in table 4. The main objective was to identify the nature of the relationship of innovation activity with company performance, but also the effect of new product introduction count is of interest. Therefore, the related regressions are expressed in separate models (1 – 3).

The first model accounts only for the effects of the two control variables, company size and M&As. As can be seen, the overall model is statistically significant at the 0.01 level and both of the control variables are statistically significant, thus justifying the inclusion of them in the model. Moreover, these control variables are in the suspected direction, though the impact of company size was initially more equivocal than obvious. The increase in company size has a negative impact on market performance whereas M&A's impact is positive, and, by assessing the standardized coefficients, the effect of company size is of greater predictive importance. The negative coefficient of company size indicates that size suppresses the potential to grow by market share. Similar conclusions have been made by Buzzel (1981) and Uslay et al. (2010). Further possible implication of this negative size effect is that competition for large

companies is more defensive by nature when they compete against losing their leading market positions. This conclusion is in concordance with Ferrier et al. (1999). Also, as was stated earlier, market share size and its relative change may have their limits, also with respect to company's financial performance (Montgomery and Wernerfelt, 1991; Schwalbach 1991), the implication being that after gaining certain market share level the company sees no extra-advantage of growing more. The positive effect of mergers and acquisitions can mostly be explained by a direct effect of gaining market share (Ghosh, 2004). This is likely especially in the short-run like in this case where acquiring company literally sources the existing customers and their investments in specific transferred mutual funds from the acquired company. Moreover, this short-run effect is the way it was operationalized in the regression equation, as was explained in 3.2.3.

**Table 4.**

Least squares dummy variable regression with lagged market share change as the dependent variable ( $N=163$ ).

<i>Variable</i>	<i>Model</i>		
	<i>1</i>	<i>2</i>	<i>3</i>
Company size	-0,600*** (0,031)	-0,803*** (0,035)	-0,694*** (0,035)
M&A	0,134* (0,238)	0,121 (0,231)	0,125* (0,211)
NPI		0.203** (0,011)	
Competitors' NPI		0,027 (0,002)	
Innovative activity			0,438*** (0,176)
Competitors' innovative activity			-0,268*** (0,347)
HH index		-0,211** (0,444)	-0,114 (0,425)
Name changes		0,069 (0,014)	0,079 (0,013)
Median management fee (%)		-0,243* (0,122)	-0,203 (0,113)
Adjusted $R^2$	0,196	0,260	0,372
F-value	2,981***	3,282***	4,836***

Note. \*  $p < 0.10$ , \*\*  $p < 0.05$  and \*\*\*  $p < 0.01$

Standardized regression coefficients reported; standard errors in parentheses.

Company dummy variables not shown.

In the second model new product introductions and the rest of the control variables are added to the regression. The overall model is statistically significant, manifesting an increase in the adjusted  $R^2$  from 0,196 to 0,260. This, along with theoretical motivation in 3.2.3, suggests that the added control variables do belong to the regression equation. The already-added control variables change only a little: the negative coefficient of company size turns larger and M&A becomes insignificant showing a minor decrease in the value of the positive coefficient. The effect of NPI is positive and statistically significant at the 0.05 level, as expected according to the literature, whereas the counter-actions by competitors show unexpected positive but statistically insignificant influence. Descriptive statistics gave already a little preliminary

estimate to this direction. The other three control variables are in the expected direction, and two of them are significant. Concentration of the product portfolio has a negative and significant coefficient implicating that diversification has a positive impact on market share. This suggests that there is no place for specialized mutual fund companies in the industry and especially large customer bases ask for a wide selection of fund types. Here, it should be noted, that the level of analysis with respect to fund types is not very specific, and more detailed level could give a more accurate picture of diversification/specialization. Management fee is also negative and significant, which may imply that increase in price is detrimental to market share growth. As was noted in the case of correlations, the fee is positively correlated with the size of company, and thus some caution should be exercised in making conclusions on its negative and quite large impact. The standardized coefficients of these two variables show that they are of equal predictive importance compared to NPI. The coefficient of product name changes is positive, as expected, but small and without statistical significance.

The third model introduces innovative activity as the independent variable instead of mere new product introductions. The significance of the model improves as the F-statistics changes from 3,282 in the second model to 4,836 in the third, both significant at the 0.01 level, and the adjusted  $R^2$  increases to 0,372. The coefficient of innovative activity is positive and significant at the 0.01 level. Further, competitors' innovative activity has a negative impact on market share change, and this is also equally significant. Based on the standardized coefficients, innovative activity of a company plays greater predictive importance. Both of these results are consistent with the theory of competitive actions and counter-actions presented in the literature review. However, in the third model the other control variables lose their significance, and only the two initial control variables, company size and M&A, are significant. Nevertheless, most of the coefficients of these other control variables remain nearly unchanged with respect to the model 2. Only the magnitude of the coefficient of product portfolio concentration decreases considerably, still retaining its expected negative direction.

In relation to the possible problems with panel data regressions all the VIF values were inspected in order to assure the absence of multicollinearity. The greatest value displayed was 4,241, and signs of alarmingly high values of VIF (more than 5, or more liberally suggested

10 by O'Brien, 2007) were not confronted. Therefore, multicollinearity poses minor threat to interpreting the results. The possibility of reverse causality was assessed by regressing the current independent variables (NPI and innovative activity) against the dependent variable and control variables from the previous year, i.e. reversing the causation of the performance relationship, as was suggested by Echambadi et al. (2006). No evidence of statistically significant causal link between these variables, neither market share change with NPI nor market share change with innovative activity, in reverse order was detected. Further, in order to assess the inclusion of company size variable and the possibility of simultaneity bias resulting from it, the regressions in models 2 and 3 were performed without this variable. The results indicate that both NPI and innovative activity remain statistically significant at the 0.10 level and at the 0.01 level, respectively. However, the elimination of the size variable does impair the adjusted  $R^2$ 's of the models, and model 2 and other incorporated variables in both models become literally statistically insignificant, supporting the inclusion of the size variable in the regressions.

A sensitivity check with another dependent variable, market share derived from the number of shareholders, was performed with identical results in relation to the impact of NPI and innovative activity. In addition, the innovative activity variable was also tested as being calculated based on the assets under management and counting for 2 year NPI data (i.e. dividing the NPIs from the previous two years by company's AUM as was explained in 3.2.2), and the results were in accordance with the results in model 3. Further, the regressions with the excluded outliers of Sampo showed expected but inflated model significances and adjusted  $R^2$  values again with somewhat similar effect sizes and statistical significances for NPI and innovative activity. These alternate regressions further imply that the effects of the main independent variables seem to be robust to different model adjustments.

Whereas the results speak of the significance of introducing new products and innovating in nascent market, one cannot ignore having the impression that NPIs as competitive acts and innovative activity as competitiveness exhibit different kind of importance with respect to market based performance for smaller and larger companies. This difference in the magnitude of competition and company size in nascent markets (and also in established ones) was also noted by Chen et al (2010). In this thesis, though, the impact of the difference in this magnitude (i.e. how large is the count of competitive acts) remains somewhat hazy, especially

in relation to the alleged difference between different sized companies in nascent industry, because there is no opportunity to compare to the level of competing in established industry, and because of the question of when an industry or market can be regarded as mature. Still, based on the regressions, for smaller companies NPI and innovating seem to be essential in order to grow as they challenge the incumbent companies. For larger companies, introducing new products and being innovative matter most as competitive counter-acting when they defend their market positions, and not necessarily as a means to increase market share, per se. However, Acs and Audretsch (1987, p. 573) note that this “small-company innovative advantage tend to occur in industries in early stages of life-cycle, where total innovation and the use of skilled labor play a large role, and where large firms comprise a high share of the market”, and based on this the competition in the mutual fund market may as well lead to a situation where no size-based advantage can be had when it grows from a nascent to a mature market.

As was found, without more information on the product differences, market segmentation et cetera, the overall company-level performance effect of NPIs and innovative activity is consistent with the suggested theoretical motivation basing on the views of first-mover advantage (Lieberman and Montgomery, 1988) and the Red Queen effect (Barnett and Burgelman, 1996; Barnett and Pontikes, 2008; Derfus et al, 2008). Introducing new products seems to improve competitive position and market based performance.

With respect to first-mover advantage management companies' improvement in their competitive positions can be seen as a result of their total number of introduced new differentiated and more sophisticated mutual funds. In more detail, new product introductions, depending on the newness and innovativeness which could not unfortunately be controlled for due to data limitations, greater probability of being a first-mover falls to competing companies in proportion to their number of introduced new mutual funds or innovative activity. Therefore, through being somehow first in the market or in some chosen (or spontaneously emerged) customer segment, some customers become more inclined to buy these funds. This represents the down-to-earth explanation in the similar manner as in chapter 2.3. The theory also suggests that if the companies growing by market share when introducing new mutual funds or being more active in it in relation to the company size really are first-movers, the performance advantages may initially emerge from the related resources and



capabilities (Lieberman and Montgomery, 1998), such as the quality of market research as a part of R&D, innovativeness in managing newly introduced mutual funds or developing administrative constructs that support company's innovative activity. From this point of view, new product introductions and innovative activity can be regarded as culminations of these underlying activities and constructs, and this portrays company's "propensity to move first into new initiatives", as was stated by Roberts and Amit (2003).

Additionally, a more active company which introduces more new mutual funds than its competitors may find it necessary even to be able to survive the competition, as was suggested by Ferrier et al. (1999). The greater magnitude of innovative activities of management companies also lead to greater performance over competitors, the similar conclusion as Young et al. (1996) made. What was also seen in the section involving the evolution of the mutual fund market and in the descriptive statistics in this section, the magnitude of introducing new products covaries to some degree among the observed companies. Where this overall variation may be a result of market specific factors, it does imply similar competitive counter-acting that Derfus et al. (2008) highlighted. Interestingly, as was noted, the innovative activity of competitors has a negative effect on focal company performance. Arising from competitive actions which represent counter-actions to competitors, a management company may incrementally improve its competitiveness by learning from the outcomes of these taken actions, as was suggested in the theory of the Red Queen effect, and positive performance outcomes may accrue.

## 5 Summary and Conclusions

### 5.1 Conclusions

The first part of the study discussed market evolution with a special focus on innovating. The mutual fund market in Finland has witnessed several types of changes in the course of its evolution. The most lucid of them is its growth from close to negligible to a significant alternative for both households and institutional investors in the repertoire of financial instruments in wealth management. This thesis shows how the activity in introducing new products varies on the basis of overall market conditions. It can be seen that during the downturns and after them new products are launched less than in the upswing, and different sized companies have slightly differing NPI counts in these market conditions, bigger companies being more active in downturns and smaller companies being more active in upswings, roughly speaking, consistent with Chen et al. (2010). Further, already in the beginning the market was dominated by few fairly large companies, although some changes in the composition of these biggest companies occurred. With the rise of Osuuspankki and Sampo, large companies cemented their market positions. However, the concentration of the market did not increase much during the research period. It was also noted that the effect of NPI may be de-concentrating, as is suggested in the earlier academic literature (Geroski and Pomroy, 1990).

The second part covered the relationship of innovating or, as this was operationalized, new product introductions and innovative activity with market performance. The results of the regression analyses suggest that new product introductions play a significant role in improving market based performance also in the competitive nascent market setting. This positive finding between NPI and performance is in accordance with earlier research, e.g. Banbury and Mitchell (1995) and Bayus et al. (2003). It was found that the importance of new product introductions as competitive acts seem to be different for companies having different market positions, as suggested by Chen et al. (2010). The dominating companies enact new product introductions in order to defend their market positions, whereas smaller companies introduce new products as a means to grow and improve their position. Also, some evidence

of innovative activity being superior to mere new product launches with respect to positive market share effect was captured, suggesting salience of this company's internal propensity in improving its performance. Additionally, this same propensity of competitors, competitors' innovative activity, was found to negatively affect focal company performance. Both of these findings are in concordance to the previous empirical work on the relationship between innovative activity and performance (Roberts and Amit, 2003; Derfus et al., 2008) and the found effects of NPI and innovative activity on company performance are consistent with the explained theories on competition. Although these results replicate the results of previous research, it should be noted that the studied context is new and therefore this study contributes to the growing literature on innovation-performance relationship.

## 5.2 Managerial implications

For the managers, the findings of this thesis can be thought to present implications in two different levels: first through the general effect of being active by introducing new products and possibly accruing consequent market performance in nascent market, and second, by experiencing the same effects in the context of evolution of mutual fund industry.

In general, as new product introductions play an important role in the repertoire of competitive actions and leading to performance advantages, this activity is supported. Especially, in rapidly growing markets this may lead to great improvements in market based performance figures when competing against other companies. However, differences among companies exist, and thus the NPIs may not lead to performance improvements but in this case they help in sustaining the existing performance and competitive position. Further, as the development of new products asks for innovativeness and skill, these abilities can possibly be cultivated by doing and learning. This also speaks for introducing more new products and keeping company innovative activity high, and therefore these should be taken into consideration in competitive situations.

In addition to the abovementioned suggestions, introducing new products specifically in mutual fund industry during its evolution is applicable, for example, in targeting new customer segments. By doing so managers can try to either utilize different financial market

changes or exploit the heterogeneity among potential customers. In practical terms, this might for example mean introducing more lower-risk bond funds in times of financial crises when the demand for this type of funds increases compared to riskier equity funds. However, it should be kept in mind that the results are based on historical data and future competitive situations may ask for different kinds of approaches.

### 5.3 Limitations and directions for future research

The limitations of the study are various. First, although they are in concordance with the extensive research on performance implications of innovation, competitive actions and new product introductions, the result of the found positive relationship in nascent market cannot be generalized without further research on the subject in other evolving and rapidly growing markets.

Second, the theoretical foundation was based on two theories on competition and both of these incorporate different, although parallel, views on introducing new products and activity in this representing company's competitiveness. The first-mover advantage clearly gives motives for including the stated first-mover effect explicitly in the analysis by counting, for example, the first in the market products, as was also done by Roberts and Amit (2003). This undoubtedly would have increased the validity of the development of theory-driven empirical setting. Accordingly, the Red Queen effect incorporates the speed of actions into the analysis (Derfus et al., 2008). In this study this effect of speed in acting and counter-acting is neglected, and although this is not seen as big a deficiency as the lack of explicitly incorporating market firsts, the same conclusion as above on the improvement on construct validity applies.

Third, we cannot be absolutely sure that the unobserved characteristics, such as companies' distribution channels and physical locations, of management companies remain the same during the whole lengthy research period, which was the prerequisite for selecting the robust fixed-effects regression. Therefore, there is some possibility of omitted variable bias.

Fourth, as Dosi et al. (1997) comment on the problems of aggregating data in the context of research on competition, this rather wide-ranging problem exists also in this study. For example, the boundaries of the observed marketplace are vague, and some level of competition is without a doubt against, for example, management companies with foreign domiciled fund portfolio. This could not be taken into account based on the existing data. Also, the emergence of sub-markets may present a problem also, since not all observed companies are actually competing with each other, but rather only with the competitors in the specific sub-market. For example, lower mid-size companies offering private banking and other services for wealthier customers may be such a sub-market, as was pointed out in chapter 4.1.3.

With respect to the future research, it is obvious that these abovementioned limitations should be tried to conquer in the forthcoming research settings. Also, it would be interesting to assess the effect of different types of innovations and their dynamics on performance in the nascent market, in the same vein as Damanpour (1991) and Damanpour and Gopalakrishnan (2001). Moreover, the found relationship of innovative activity and performance in the nascent market setting should be investigated by more traditional means, i.e. with actual products, and thus surpassing the related oblique definition of mutual funds. The effect of various other company characteristics, such as diversified retail banks and specialized companies on some other more viable arguments than just product portfolio (Klepper, 2002; Santaló and Becerra, 2006) and regional factors of business, i.e. multinational and domestic companies (Michel and Shaked, 1986) present further directions for future research. This additionally implies the use of some other research methods, such as random-effects regression models. Lastly, applying and retelling the research avenue suggested by Derfus et al. (2008), the nascent and growing market may serve as a playground for positive sum competition where new product introductions of competitors help to develop markets, which a focal company can also benefit from, indicating a win-win type of competitive dynamics. Surely, finding such an effect would be more than comforting in these times of harsh and pervasive competition.

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